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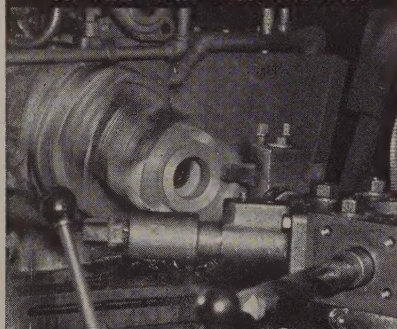
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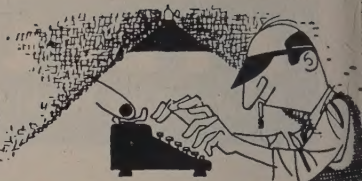
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behind the scenes



Looking Ahead

A man named Bouche-Leclercq once wrote a book which he called "*Histoire de la Divination dans L'Antiquite*," on account of he was French, and it always came easier to him to write in French than in English. His stubbornness in this respect limited the circulation of his book, which was already hampered by the weight of the text.

But divination in America! Ah, that's a different story. Perhaps no nation on earth has ever been more interested in divining the future than the U. S. And in all this broad land no class of people has been more interested in forecasting than businessmen. STEEL takes pride in having discovered an interesting fact. The nonprofessional forecasters among businessmen are often more accurate than professionals.

So, for the past several years, STEEL has been sampling the divining abilities of some 7500 nonprofessional forecasters. The results have proved fantastically correct. The recessions of 1949 and 1954 were hit on the button. Last year, our forecasters were enthusiastic and accurate about 1955's prospects.

The 7500 are being polled again, and a composite of their thinking will appear in STEEL's Metalworking Yearbook (scheduled to hit your desk early the first week in January). If Bouche-Leclercq were to write a second *histoire*, this time on nonprofessional business diviners, he might have said:

"The divinations encountered in the metalworking book of the year give one furiously to think. Regard, this so formidable business oracle at the stroke of an eye informs of the sales volume, of the manufacturing capacity, of the employment, of the costs in the year next! Tiens! With the fountain pen of one's aunt one may copy the predictions and divinations of the metalworking book of the year of STEEL, and in due time one might astonish one's self by comparing these so resolute facts and figures."

That's a corny way of putting it, but, really, metalworking management's expectations are so carefully

reported in STEEL's Yearbook that they serve as a guide to industry all year. Remind us some time to you how the editors and statisticians process their statistics. That's story in itself.

Advance Wrapping

The Yearbook, by the way, has been in the works for some time. The wrappers for it were ordered in July and arrived in October. Right now 40,000 wrappers have been printed, and they are stacked up in the mailing department. You might be inclined to think paper is light, but that wrapper stock weighed 15 lb. It comes from the Kraft mill of the International Paper Co., Mobile, Ala.

This brown Kraft paper has been in tremendous demand for many years, and even if you get your order in early, there's always a possibility that the government can step in at any time and grab off all the paper in sight. We don't know what Uncle Sam is so crazy about brown wrapping paper, but he is, and if you didn't know it before, may we remind you that we didn't either.

Boon to Bones

"*Arizona Progress*," a house organ prepared, published and distributed monthly by the Valley National Bank in Phoenix, Ariz., exhibits a waggish sense of humor as a banking institution. The November issue carried a letter to the editor from a "Pox Vobiscum Service Co. Inc.," calling attention to its prompt and useful service. "We now write obituaries for a flat fee of \$5 each, and we cordially solicit your business. Please call us at your earliest convenience and arrange a sitting while you are still able to sit," dryly whispered the opening paragraph.

The first notion that occurs to us is that this is really ghost writing at its peak.

Shrill

4 manufacturers to \$82,000.00 annually handling waste materials!

These four industrial plants expect to save, in labor costs alone, during the first five years service of the Dempster-Dumpster System—

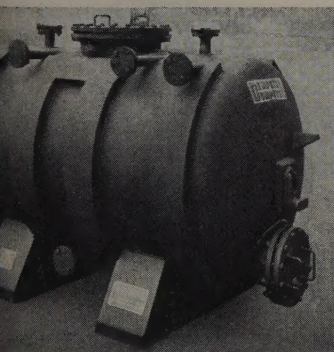
A PLASTICS PLANT: \$26,958.00 savings on an investment of \$9,523.50 in Dempster-Dumpster equipment. Savings alone pay for equipment in two years.

A CHEMICAL PLANT: \$204,076.75 savings on an investment of \$40,968.00 in this equipment . . . savings pay for equipment in one year.

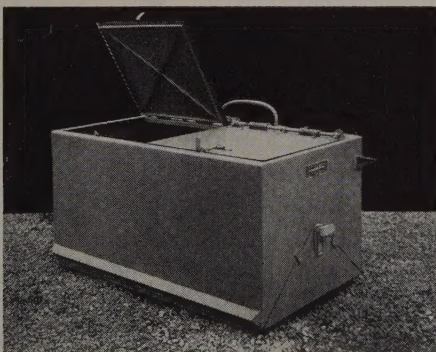
AN AUTOMOTIVE PLANT: \$135,000.00 savings on an investment of \$19,272.00 . . . savings pay for equipment in 9 months.

A PAPER AND PULP MILL: \$43,104.00 savings on an investment of \$10,750.00 . . . savings pay for equipment in 1¼ years.

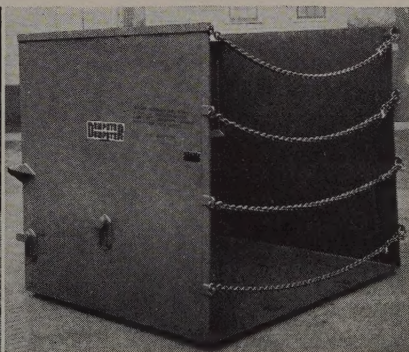
Those are typical examples. Visualize a Dempster-Dumpster, operated by only one man, the driver, serving scores of big steel containers, one after another, in your plant. Containers of many designs and types, handling waste or salvable materials, raw or finished products, fluids including acids, combustibles, dusty materials—anything that can be handled in up to 21 cu. yd. detachable Dempster-Dumpster Containers . . . payloads up to 19 tons. Savings are tremendous! Take advantage of our free engineering service, which determines by fact-finding survey the cost cutting possibilities of this system in your plant. Dempster Brothers, Inc.



Gal. stainted tank with brine lining channels.



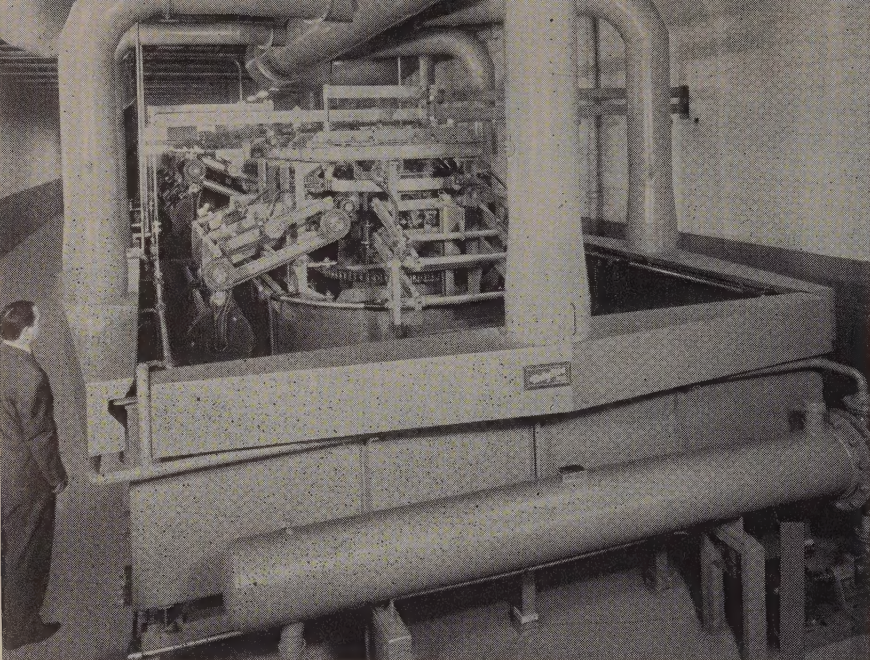
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LETTERS TO THE EDITORS

Article Put to Use

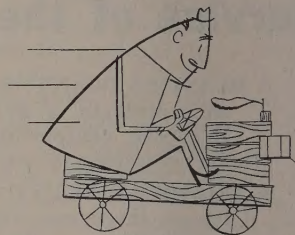
We think the Program for Management article, "Value Analysis" (Sep 19, page 101), contains considerable information valuable to key men in any organization. The article was well written and gives concrete examples where cost reduction is possible.

We hold management meetings once a month, and the reprints we request previously were handed to each department head and to key supervisors. A definite program was worked up whereby specific suggestions on over-all cost reduction are being sought.

Would it be possible to secure additional reprints?

C. S. Beatty
Vice President-General Manager
Delta-Star Electric Division
H. K. Porter Company Inc.
Chicago

Safety Belts and Fox Tails



Most of the efforts described in the Mirrors of Motordom column of September 19, "Detroit Starts Safety Race" (page 75), seem in the Boy Scout stage, like the so-called safety belt. This is about as useful and as effective as the fox tail tied to the auto radio aerial.

The safety belt idea is ridiculous. At impact, the body—from the bottom down—needs no \$75 safety belt. The rest of the body by natural instinct is restrained from going forward. What really does go forward at impact is the head. The belt would be safer and more effective if it were secured to the head or neck, not the waist (and especially around the inventor's neck where it belongs).

You mention that Detroit is interested if you've got ideas on safety. That is the biggest falsehood I ever heard of and I challenge it. I have several inventions that are really worthy. One is a pneumatic rubber auto bumper that reduces damages to a minimum, but the Boy Scouts in auto engineering don't want it.

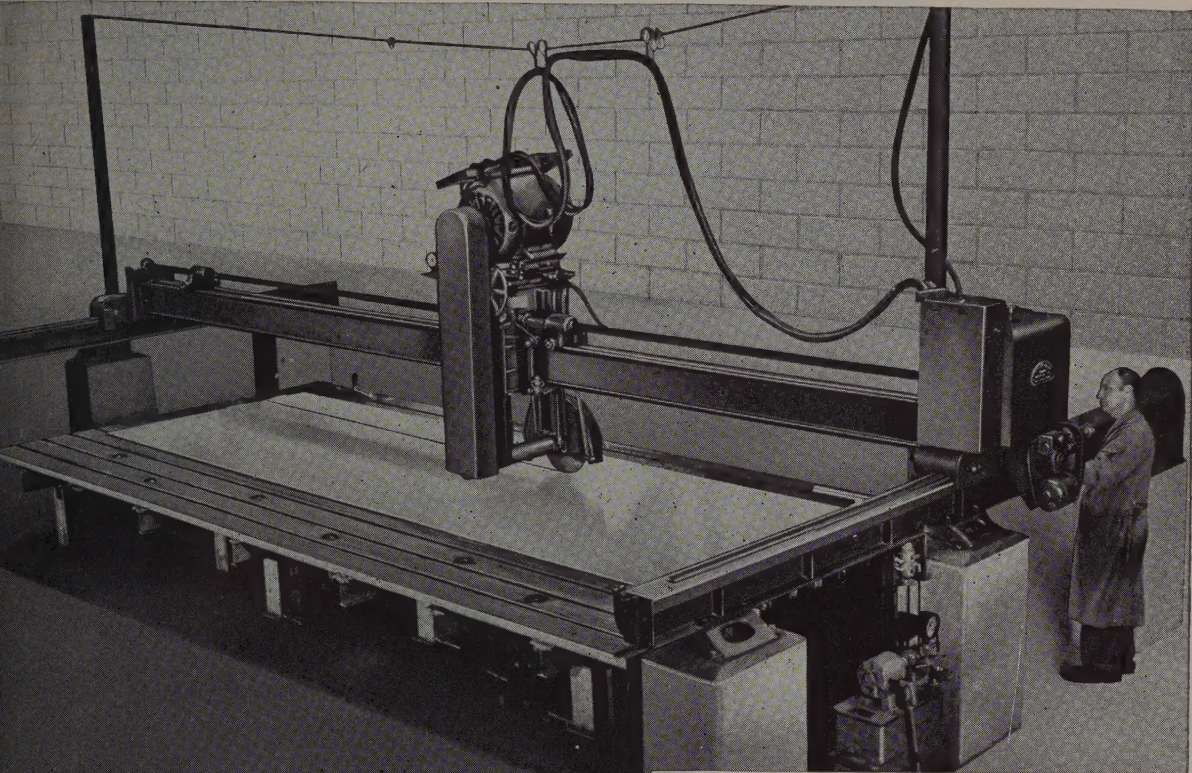
W. W. H. H.
Private Research Laboratories
6 Havens Road
Cumberland, R. I.

Salesmen To Read Editorial

I noticed in the Letters to the Editors column of Sept. 19 (page 10) that a number of people were enthusiastic over an article, "What Cost Price Fighting?" (July 25, page 41). I did not see this article, but if a reprint is still available, please let me have it.

It has been my practice to read the Letters to the Editors column.
(Please turn to page 12)

FRASSE INSTALLS HUGE ABRASIVE PLATE SAW...



Large plates (up to 240" long) can be cut on this new Frasse abrasive saw. This means fewer welds . . . lower labor costs . . . and a more saleable product.

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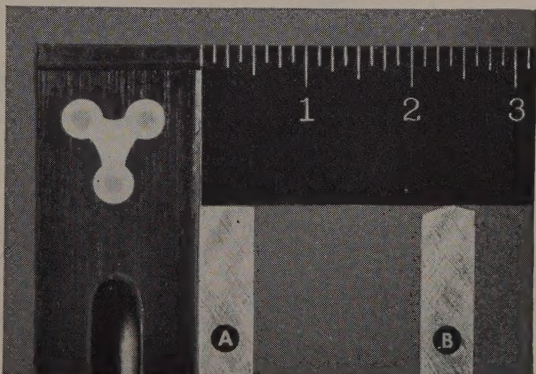
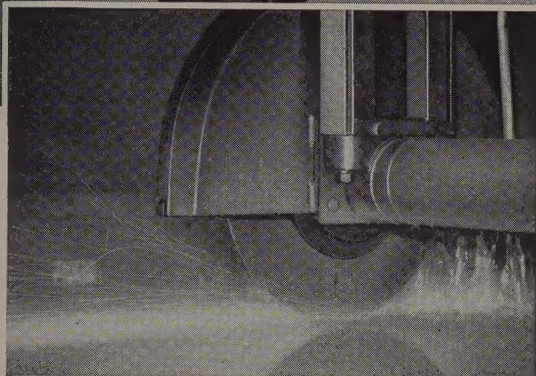
So, for dependable service, quick delivery . . . and a product that can contribute to your profit — depend on Frasse. A choice source for your stainless steel and aluminum requirements.

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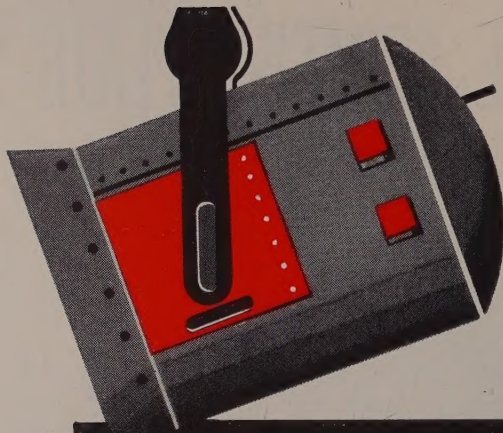
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LETTERS

(Concluded from page 10)

magazines which come into our office and to bring to the attention of management, anything which merits the time. I read your editorial of Nov. 1 "Why Cut Prices?" (page 57), and brought it to the attention of our chairman. Our salesmen have been asked to read it.

Carl Sift
Staff Assistant
Moorlane C
Tulsa, Okla.

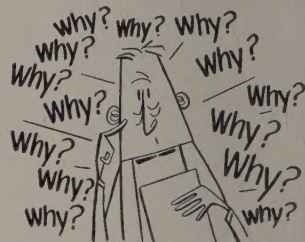
Re-Equip Method Lauded

Please send us a supply of the worksheets on the simplified guide, as published in the article, "When To Re-Equip" (June 20, page 99).

We believe this method to be the best yet devised for comparing the cost of replacing equipment, and we appreciate your forwarding this information to us.

Robert E. Lov
President
Grielder Industries Inc.
Bowling Green, Ohio

Questions on Cost Reduction



Our section is interested in the article "Saving Dollars in Manufacturing" (Oct. 24, page 104). As you may know, we at GE have our own approach to the problem through value analysis.

Your article referred to the 261 "why" questions used in cost reduction work at Westinghouse Electric Co. and covered the "why" material questions. We would like further information on the Westinghouse method.

F. R. Decker
Engineer
Small Aircraft Engine Dept.
Aircraft Gas Turbine Division
General Electric Co.
Everett, Mass.

• Write: H. C. McDaniel, Manager of Technical Information, Westinghouse Electric Corp., 3 Gateway Center, Pittsburgh 30, Pa.

Story Boosts Small Firms

Your article, "Keep Your Production Growing" (Nov. 14, page 101), is well organized and highly readable. It is a fine boost for the services of independent development organizations, such as our firm.

Your splendid article will help awaken complacent managements to the urgency of the need for continual product development and will encourage them to utilize the outside experience help that is available.

We would be grateful if you can send three reprints.

Bernard Woodward Jr.
Creative Engineer
Rochester 21, N. Y.

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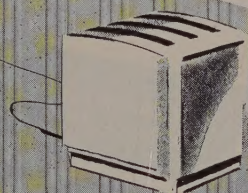
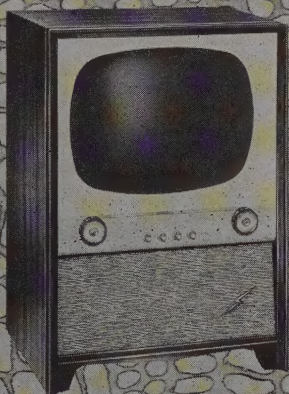
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c. 12-13, Material Handling Institute Inc.: Annual meeting, Hotel Statler, New York. Institute's address: One Gateway Center, Pittsburgh 22, Pa. Managing director: R. Kennedy Hanson.

c. 12-16, Atomic Exposition and Nuclear Engineering & Science Congress: Public Auditorium, Cleveland. Information: International Atomic Exposition, 931 Book Bldg., Detroit 26, Mich.

c. 13-15, Industrial Truck Association: Winter meeting, Hotel Statler, New York. Association's address: Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: William Van C. Brandt.

a. 3-6, Institute of Scrap Iron & Steel Inc.: Annual meeting and exhibit, Sherman hotel, Chicago. Institute's address: 1729 H St. N. W., Washington 6, D. C. Executive vice president: E. C. Barringer.

a. 9-13, Society of Automotive Engineers Inc.: Annual meeting, Sheraton-Cadillac hotel and Hotel Statler, Detroit. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

a. 11-13, Aluminum Extruders Council: Annual meeting, Saxony hotel, Miami Beach, Fla. Council's address: 209 Washington St., Boston, Mass. Executive secretary: Phillip Lemelman.

a. 11-14, American Road Builders' Association: Annual convention and exhibit, Municipal Auditorium, Miami Beach, Fla. Association's address: World Center Bldg., Washington 6, D. C. Executive vice president and secretary: Eugene Reybold.

a. 18-19, Caster & Floor Truck Manufacturers Association: Annual meeting, New Weston hotel, New York. Association's address: 27 E. Monroe St., Chicago 3, Ill. Secretary: Harry P. Dolan.

a. 18-19, Steel Shipping Containers Institute Inc.: Winter meeting, Hampshire House, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

a. 19-20, Steel Plate Fabricators Association: Annual meeting, Palmer House, Chicago. Association's address: 79 W. Monroe St., Chicago 3, Ill. Secretary: J. Dwight Evans.

a. 20, Malleable Founders' Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 15, O. Secretary: Lowell D. Ryan.

a. 23-24, Industrial Heating Equipment Association: Annual meeting, LaSalle hotel, Chicago. Association's address: Associations Bldg., Washington 6, D. C. Executive vice president: Carl L. Ipsen.

a. 23-25, Truck-Trailer Manufacturers Association Inc.: Annual meeting, Edgewater Gulf hotel, Edgewater Park, Miss. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Hulse.

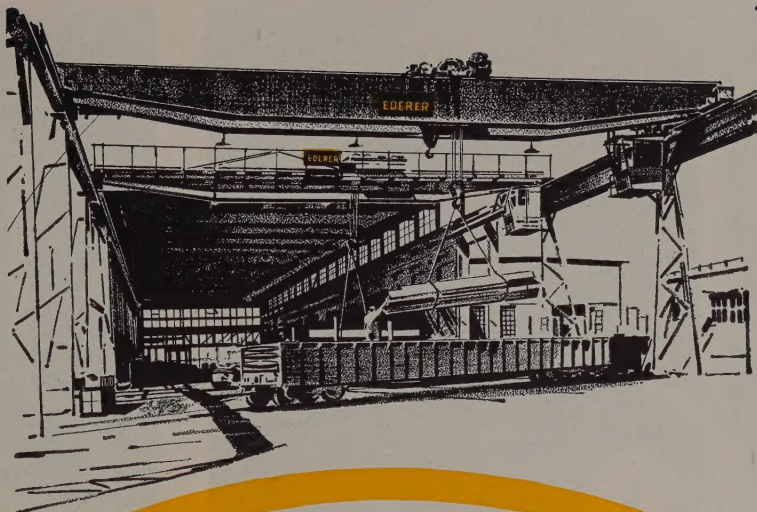
a. 23-26, Plant Maintenance & Engineering Show: Convention Hall, Philadelphia. Information: Clapp & Pollak Inc., 341 Madison Ave., New York 17, N. Y.

a. 24, Cutting Tool Manufacturers Association: Annual meeting, Detroit Yacht Club, Detroit. Association's address: 416 Penobscot Bldg., Detroit 26, Mich. Executive secretary: Martin J. Ewald.

a. 24-27, American Management Association: General management conference, Fairmont hotel, San Francisco. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

a. 26-27, Blast Furnace & Coke Association of the Chicago District: Winter meeting, Del Prado hotel, Chicago. Information: C. W. Bruce, chief engineer, Republic Steel Corp., 11600 S. Burley Ave., Chicago 17, Ill.

a. 28-Feb. 4, Industrial Diamond Association of America Inc.: Annual meeting, Hollywood Beach hotel, Hollywood Beach, Fla. Association's address: Box 175, Pompton Plains, N. J. Executive manager: Athos D. Leveridge.



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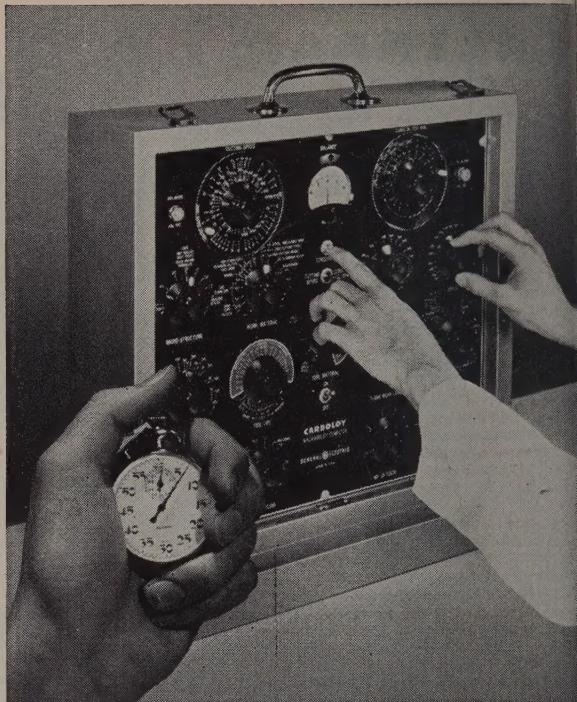
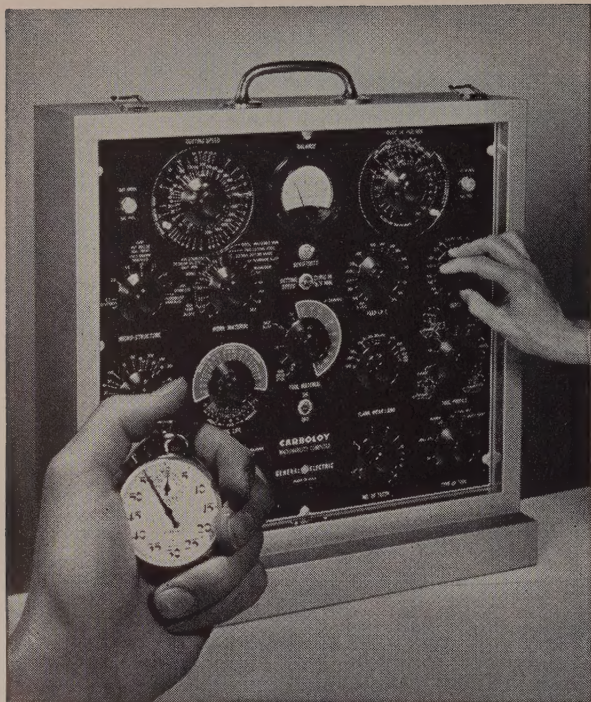
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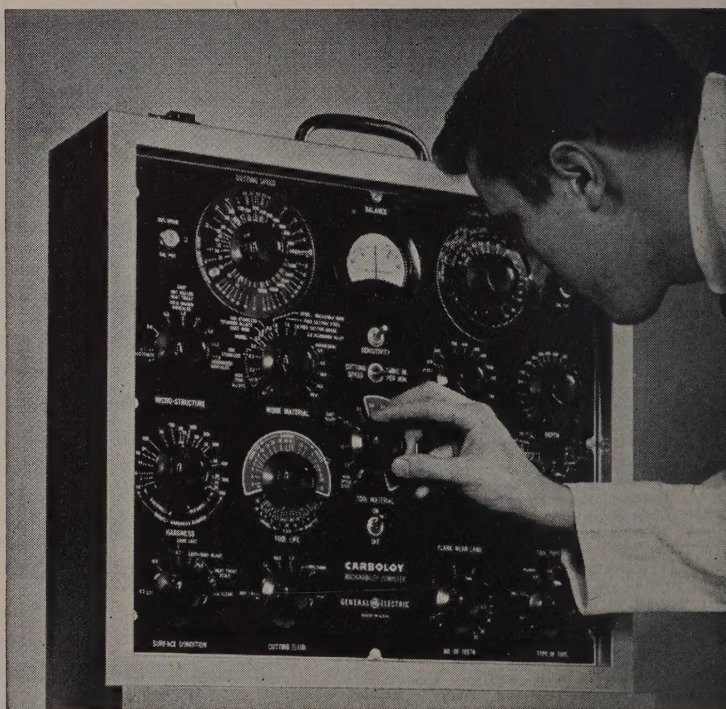
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Metalworking Outlook

Tax Topics

At least one important congressman doesn't think Congress should lower taxes generally in 1956. He's Rep. Wilbur Mills (Dem., Ark.), ranking Democrat on the tax-originating House Ways & Means Committee. He's also chairman of a House-Senate subcommittee investigating the impact of taxes on the economy. Testimony early last week from nongovernment economists was unanimously against tax cuts. Mr. Mills said he agrees with their views, but he notes that 1956 is a Presidential election year and that politics, not economics, will probably determine tax policy.

Pentagon Relaxes a Rule

The Defense department has eased the requirements of a directive which limited payments on incentive-type and price redetermination-type contracts to 105 per cent of certified costs. That means that payments will no longer be limited to 105 per cent of cost until final pricing of the contract. It also means that contractors no longer need to certify each individual billing. Similarly, quarterly reporting has been simplified.

Auto Suppliers: Tough Times Coming?

Companies primarily engaged in the production of original equipment for autos won't perform so well over the next three to five years as they have during the last decade. So says *Value Line Investment Survey*. It believes the dynamic spurt of the auto industry appears to be topping out, at least temporarily. The result will be increased pressure by auto assemblers on parts companies to reduce their prices and an accelerated trend by the five auto builders to make more of their own parts.

More About Birthmarking

The Defense department wants its marking standard extended to more steel products. But continuous marking would not be required as it is on 75 products to which the standard already applies. The expense of continuous marking already jeopardizes the standard, so the Pentagon is easing up on that requirement for the new items which are mostly large-tonnage products. A proposal for extension is being circulated to industry and within the department. The aluminum standard is almost ready for issuance; producers are already marking their metal. A nickel marking standard is being circulated again through industry and the Armed Services. Plans are stalemated at the moment for a copper marking standard because there aren't any industry-wide commercial designations.

More Power Ahead

"We will have to more than double our generating capacity within the next ten years," says O. B. Falls Jr., manager-marketing for General Electric Co.'s Atomic Power Equipment Department. This year, the nation will

Metalworking Outlook

use about 476 billion kw-hr. By 1964, he estimates, we will need 1040 billion kw-hr. GE studies show that 14 per cent of all new generating plants going into service in 1970 will be nuclear powered; 65 per cent of all additions to generating capacity in 1980 will be atomic.

Needed: 50 Million Stockholders

To meet the cost of expanding our utilities and other businesses, we need to raise the number of stockholders in American industry to 40 or 50 million, compared with the present 6 or 7 million. That's the opinion of GE Chairman Philip D. Reed. Particular attention must be given to encouraging more and more families in the \$5000-to-\$10,000 income bracket to invest part of their savings, he says.

Transformation in Coal

Coal output is running 20 per cent ahead of 1954 levels and should approach the 1953 record of 457 million tons. Aside from high-level requirements in the U.S., a major reason for the gain is rising demand from Western Europe. Coal reserves there are becoming so depleted that concern is mounting. Research abroad is active to find substitutes for the fuel.

Boom in West German Steel

West German steel plants are refusing new orders because they have 6-to-10-month backlogs on common grades of the metal. Commitments have piled up 12 to 14 months in advance on special steels. As in the U.S., the shortage is especially severe in plates. In negotiation now are higher wages for steelworkers, but the increase is not likely to boost present German steel prices.

Canadian Construction Climbs

The 1955 investment in new construction in Canada will hit \$4.1 billion. That's up from \$3.7 billion in 1954. The total includes 120,000 new houses, compared with 102,000 in 1954. Prospects for 1956: Even more building, especially because there will be high outlays for gas and oil pipe lines.

Straws in the Wind

Comments one American purchasing agent: Shortages of many raw materials indicate that industry is suffering a surplus of prosperity . . . Kaiser Steel Corp. is studying the possibility of a major expansion in steel production and rolling mill facilities at Fontana, Calif. . . . Retail toy sales in 1955 look like they'll reach \$1250 million, a record . . . Square D Co., Detroit, and Electric Controller and Mfg. Co., Cleveland, have called special stockholder meetings for Dec. 28 to vote on merging the two firms; Square D would be the surviving corporation . . . Class I railroad income in October climbed to \$92 million, compared with \$77 million in the same 1954 month . . . General Motors Corp. has offered its auto dealers five-year franchise agreements to supplant the traditional one-year contract.



December 12, 1955

Labor's Opportunity

Last week, the 109 unions organized under the banner of the American Federation of Labor and the 32 in the Congress of Industrial Organizations were formally welded into a single union with 16 million members.

As the most powerful union organization in the world, it could look back on a growth of 400 per cent since the turbulent days of the New Deal. The old issue of AFL craft or trade unions versus CIO industry unions could be forgotten. So could the raiding of membership and many of the personal animosities. So could the \$1.7 million John L. Lewis claimed his United Mine Workers loaned the CIO to get it started in 1935.

In an era of peak U. S. prosperity, the powerful new union is setting its sights on these goals:

1. The return of a larger share of industry's profits to mass circulation through still higher wages.

2. The organization of additional millions of workers, especially in the South.

3. The expansion of union-sponsored educational and apprenticeship programs for technical training of unskilled and semiskilled workers.

4. The extension of Supplementary Unemployment Pay to cushion the shock of changing to the age of automation.

5. The establishment of the 30-hour week to multiply job opportunities and keep unemployment in hand.

6. The election of candidates to Congress and state legislatures who are willing to support the labor program, including repeal of the Taft-Hartley Act.

The AFL-CIO is bursting with new power. How it will use that power will be made known at the polls and at the bargaining table over the coming months.

Union leadership has the opportunity to exert excessive pressure for concessions and benefits that could seriously impair the ability of industry to provide jobs.

Union leadership has equal opportunity to work hand in hand with management in the orderly achievement of the social progress every American is entitled to.

A greedy, short-term policy will be at the expense of the AFL-CIO over the long pull. Labor statesmanship will be to the lasting mutual benefit of labor and management.

Irwin H. Such
EDITOR

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Labor Wants: More Money . . .

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More Holidays, Vacations . . .

Better Insurance, Pensions . . .

Union Shop

Management Wants: Longer

Contracts . . . No Interference with

Right To Manage . . . Differentials

for Skill, Productivity . . . More

Workable Contracts . . . Longer

Probations

Next Year's Labor Outlook

FOR TWO DECADES the labor leaders have come around every year or two with a pistol in their hand and say: 'Mr. Employer, pay more or I shoot.' Each time employers have paid more. This game is nearing its end. Reality has caught up with the collective bargaining table. Wages can only be raised in proportion to the increase in productivity."

So writes Harold J. Ruttenberg in the December *Harper's*. Mr. Ruttenberg is a one-time CIO economist who says he "invented" the Guaranteed Annual Wage. Today, he's president of a drilling machinery manufacturing company whose 243 hourly workers belong to the United Steelworkers of America.

Agreement—Other businessmen also sense a changed climate in labor-management relations. "We're starting a new era when management can and must present strong demands just as labor does," say spokesmen for Associated Industries of Cleveland, an association dealing in personnel relations of companies in greater Cleveland.

Says a Pittsburgh employer: "And 1956 is the year to get started. It looks like a boom period. We can afford some economic concessions. But we must trade those for concessions from labor." Of course, management has long been presenting demands to labor, but many analysts think they've been weak usually.

What management wants varies from company to company, but generally, those listed above summarize the major needs.

Longer Contracts—Some management men favor the annual contract because of its flexibility, but the majority seeks a two or three-year document because of its promise of longer freedom from labor harassments. Settlements involving pensions, Supplemental Unemployment Pay and some forms of social insurance make a long-term contract a necessity. Not practical on a yearly basis are arrangements with banks and insurance companies that those types of provisions require.

Right To Manage—Management must be sure that its next contract doesn't contain some stipulation

that interferes with its right to transfer, fire and promote, lay off and recall employees. And management is becoming increasingly aware of the need to do those things as free from seniority considerations as possible.

Differentials—Industry recognizes more and more the necessity of paying on the basis of skill and productivity. But the problem is to set up some standards of skill, particularly in the small and medium companies. An approach to the matter might be an adaptation of the large steel companies' job classification and description system. Such a setup, with its 6-cent pay increments between job grades, might answer the complaints of the highly skilled, too. "They're restless," comments James Wible, director of personnel for Weatherhead Co., Cleveland, "because they see the pay scale narrowing between them and the unskilled."

Workability—Management needs to have more to say in the establishment and description of work standards and in the elimination or consolidations of job classes. Important, too, is a workable grievance procedure. Says one industrial relations director: "In our plant, more grievances arise in this workability area than in any other."

Longer Probations—Most probationary employees aren't included in contracts. The statutory minimum is 30 days for a new worker to be on probation. In the majority of contracts, the bargained limit is also 30 days. Employers are finding that provision is often troublesome. A man's skill or lack of it often can't be established in 30 days. Needed are longer probationary periods—to vary with individual circumstances.

What labor wants in 1956 is what it always wants—more. Because the first quarter is going to be sensationally good economically and because that's the period most unions pick in bolstering their arguments that industry can "afford" to grant an increase, the wage demands—and all other demands for the year—are going to be high. Settlements will, of

course, be lower, even a little more subdued than in 1955. That's because of the situation Mr. Ruttenberg mentioned. Labor leaders don't recognize it publicly, but it's forcing itself to be recognized at the bargaining table. Many observers feel that gimmicky demands—SUP, shorter workweeks, more insurance and pension—came because industry is getting tougher about granting the basic demand, higher wages. It's not always true, but fringes usually cost less than straight pay hikes.

Money—Next year, granted the assumption of good business for most of the period, look for wage increases that will average 8 to 10 cents nationally, compared with 10 to 12 cents in 1955. As a result of agitation by skilled workers, they should do a little better than semi and unskilled people.

SUP — Supplemental Unemployment Pay is not proving to be the potent rallying cry organized labor hoped it would be. Skilled people are lukewarm about it. But it's still potent enough to be a major issue in the important steel negotiations next spring. And the CIO auto workers will demand it. A little more than half their contracts still don't contain the provision. In basic steel, David McDonald will go after a full year's SUP like he won for the canworkers. It's unlikely that he'll get it, although he may win a package that's a little broader than the autoworkers wrapped up.

Vesting—The policy of putting pensions on an individual basis so an employee can take his accumulated total if he leaves a company before retirement is becoming widely accepted. Organized labor is toying with the idea of extending it for SUP. It has been tried in the contracts with the glass companies. Look for it to be tested in a few more instances in 1956. But it won't be a major issue next year.

Holidays, Vacations—Expect the usual pressure here. It will be especially strong for the seventh holiday—election day, the employee's birthday or half days before Christmas and New Year. One

• Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

demand that's cropped up with increasing frequency this year: Double time for all hours of 11 and more in a 24-hour period, with the conventional time and a half for the ninth and tenth hours. A parallel demand is for time and a half on the first four hours on Saturdays and double time for work over four hours on that day.

Other Fringes—The unions will demand customary liberalization of insurance and pensions, too. Theoretically, the steel companies need not discuss either of these issues next summer, but odds are that they will permit all phases of the

contract to be opened. What the grant can be a pattern for much of industry.

Union Shop — Auto companies gave in here in a provision that was almost overlooked last summer. Unions will fight for it with renewed vigor in 1956.

35-Hour Week—It will be a talling point next year, but it will remain just that unless business relapses.

The crucial 1956 negotiation will be in steel next May and June. Aircraft companies parley earlier, but their settlement is not likely to be pattern-setting.

Labor experts point out: A combined AFL and CIO will be speaking louder next year. It's time that management raises its voice, too.

Productivity Study Released

American manufacturing industries registered an average annual productivity gain of 3 to 3.6 per cent between 1947 and 1953. From 1939 to 1947, the average annual gain was 0.5 to 1.5 per cent.

Those are the conclusions of the Labor department in its first study of output per man-hour since 1942. Says Ewan Clague, commissioner of labor statistics: "The 1947-53 average is in line with the average gain of 3.3 per cent between 1900 and 1939, the long-run period covered by previous bureau estimates."

The figures will provide ammunition for management and labor in contract negotiations and in fighting over effects of automation. Still to come are the Labor department's automation studies. They'll probably be released early next year.

Electronics Boom in L. A.

More than \$22 million was invested in new plants and expansions by the electronics industry in metropolitan Los Angeles in the first ten months of this year.

The Los Angeles Chamber of Commerce says billings of the 43 electronic firms in the area are \$916,680,000.

H. Leslie Hoffman, chairman of the chamber's electronics committee, anticipates billings next year will reach \$1 billion.



Employment will climb in '56; nationwide strikes unlikely

Kohler Strike Timetable

Dec. 12, 1953 . . . Kohler Co. announces its intention to terminate contract at its expiration on Mar. 1, 1954.

Feb. 28, 1954 . . . Union membership votes to take strike vote.

Mar. 14 . . . Union executive board authorized to call strike.

Mar. 26 . . . Union announces strike will be called Apr. 5 if no agreement is reached by then. Negotiations break off.

Apr. 5 . . . Strike called. Plant production shut down for 54 days. Two-month period of mass picket lines, violence.

May 6 . . . After company appealed to Wisconsin Employment Relations Board for injunction to halt mass union picketing, plant reopened. Three days later the union picket lines formed again.

June 1 . . . Picket lines were reduced and nonstriking employees got production under way again. Negotiations resumed between company and union with Wisconsin Employment Relations Board sitting in.

June 29 . . . Negotiations locked, union charges company walked out.

July 12 . . . Union files with National Labor Relations Board, charging unfair labor practices by Kohler.

Aug. 10 . . . Parties meet with Federal Conciliation Service. Union drops several demands including wage increase.

Nov. 10 . . . Union submits proposal to build contract within framework of Kohler's competitors, Crane Co., American Radiator & Standard Sanitary Corp., Briggs Mfg. Co. If this fails, union proposed submission of issues to arbitration with understanding that no award could exceed provisions of competitors' contracts with CIO.

Jan. 28, 1955 . . . Federal Mediation & Conciliation Service calls parties to Washington to negotiate.

July 26 . . . Federal Mediation Service at Chicago meets with parties. Union drops maintenance of membership demand, accepts Kohler's health-medical plan instead of Blue Cross-Blue Shield plan. Kohler offers to take back 540 workers—none of 90 fired union leaders.

Kohler Strike: Case Study

N LISTING its demands for a new contract, the UAW-CIO threw the book at Kohler Co., a seemingly minor power when stacked against the auto giants the union normally tackles. But the union had no idea of the ferocity with which its demands would be hurled back.

The exchange set off one of the bitterest and longest strikes in the postwar period. And the \$7 million the CIO-UAW has pumped into it makes it one of the union's most costly campaigns.

Queries—The strike is entering its 21st month. How near is a settlement? A better question: Can it be settled?

To Herbert V. Kohler, president of the Wisconsin plumbing fixture firm, basic issues involving the nation's free enterprise system are at stake: Compulsory unionism, discounting of the individual's

merit, joint company-union management, pattern settlements, inflation through granting wage increases not justified by productivity increases.

To the union which won representation of the workers only a year before, here is a company yet to catch up with accepted industrial union contracts: "Wages on an hourly basis are lower than the average of the company's industry; seniority means little; there is no standard arbitration procedure on disciplinary action or discharges; no union shop."

Tough Opponent—Kohler is a family-owned firm, with no stockholders to answer to or get pressure from. The company had weathered a bitter strike in 1934 in which two lives were lost. The issue then: AFL representation. It ended in a National Labor Re-

lations Board election in which the AFL was rejected. From then until 1951 an independent union represented the employees. That year, an election was held for representation by AFL, CIO or independent union. The last won, but a year later the CIO got in by 78 votes in another election.

In a prerogative seldom exercised by industry today, Kohler made the first move in the current situation. It announced (see timetable) its intention of terminating the contract covering about 3300 production and maintenance workers.

Stalemate—When the bargaining sessions failed to produce little more than the company's offer to renew the old contract without change, the union threatened a strike and negotiations collapsed immediately. Kohler walked out, charges the union.

With the strike on Apr. 5, 1954, came mass picketing. Production was stopped for 54 days. Detroit goon squads appeared and violence

shook the small Wisconsin town of Kohler.

New Issues—The company answered the union's strong-arm tactics with its own, and from developments in the next two months sprang new problems which now loom as the key issues in the situation.

1. Management refused to continue negotiations as long as mass picketing continued.

2. The company fired 90 people, all union officers, picket captains and stewards except one.

3. The company appealed to the Wisconsin Employment Relations Board to direct the union to cease unlawful picketing. The plant opened June 1, and production got under way slowly, with nonunion employees passing through peaceful picket lines. Management announced at the time that no new employees hired would be discharged to make room for returning strikers when the strike was over. (This is in accordance with Taft-Hartley.) Workers were given a 3-cent per hour wage increase.

Enter, NLRB — These brought NLRB action against the company through union charges of Kohler's failure to bargain in good faith.

The regional NLRB holds that 12 of the firings were justified because of illegal conduct, but that the other 78 were discriminatory. Hearings are still under way and will probably last another two or more months.

New Union Points—After the plant reopened in June, several meetings, including some with the Federal Mediation & Conciliation Service were held (see timetable). Result: The union has backed down to seven basic points.

1. Arbitration for grievance procedures, including disciplinary action and discharges.

2. Full seniority rights.

3. Reduction of wage demands to 10-cent, across-the-board increases.

4. Noncontributory pension plan.

5. Lunch period for the enamel shop, which has none at present.

6. Reinstatement of all 90 workers fired.

7. When the strike ends, strikers to be returned to original jobs.

New Kohler Offer—The company has offered these proposals:

1. Increase its wage offer to cents, all nonincentive workers get 10 cents.

2. It will take back all workers with 15 or more years of seniority—about 540. None of these are to be the 90 union leaders fired.

Prospects—The last negotiation held between Kohler and the CIO were in early August in Chicago. What's the outlook now?

Lyman Conger, Kohler negotiator, answers: "We're making more overtures. We were told July that the union wanted to settle, and the sessions were waste of time."

Says Emil Mazey, secretary-treasurer of UAW: "We've made all the concessions we can. We're waiting for the outcome of the NLRB hearings. Until then, we're setting up a national campaign to persuade people to stop buying Kohler plumbing ware."

Top Card—Kohler appears to be holding the top hand currently. Management says 80 per cent of its work force has been restored by nonstriking personnel. It claims it's making a good profit and ended up in the black in 1957 despite the lost production.

Key to the outcome may be the NLRB hearings. Board members admit proving failure to bargain in good faith is a tough one: "You've got to prove what management is thinking." If the regional board's decision holds and if the opinion is upheld should it go to the U. S. Circuit Court of Appeals, Kohler will be required to sit down at the bargaining table. When settlement comes, it would have to take back all the workers with the exception possibly of the 12.

If failure to bargain in good faith is not proved, the CIO's position will be precarious. Even with eventual settlement, less than 600 strikers would get their jobs back (if the company has restored 80 per cent of its work force without nonstriking personnel). A representation election then would probably go against the union.

Union Originally Demanded . . .

1. Union approval of all shop rules established.
2. Union approval of work schedules and work-hour changes.
3. Union approval of subcontracting policies.
4. Arbitration of everything except wages, job standards and rates.
5. Automatic wage progression with elimination of merit increases.
6. Superseniority for union officials and union stewards.
7. Strict seniority.
8. 20-cent, across-the-board raise, plus 10 cents an hour for skilled workers.
9. Other demands, including vacation increase, seventh paid holiday and noncontributory pension plan.

The Company Offered . . .

1. A 3-cent wage boost.
2. No strict seniority, but an improved plan over the former contract.
3. Leaves of absence for union officials.
4. No steward to be transferred involuntarily out of line of seniority.
5. Guarantee that working schedule would not be reduced below 32 hours per week for more than three weeks.
6. To renew the old contract without change for one year—including wages.



children, not workers, will get the gifts when . . .

Santa Comes to Industry

COMPANY CHRISTMAS parties have taken on a new look.

The man behind the Santa Clausard may be "Mr. Big" himself, at chances are he'll be handing gifts to children instead of employees. It's part of a trend to bring the family into the fun. **Bring the Kids**—Many industrialists, fearing the wrath of a disappointed army of 10-year-olds, hire professional organizers to make arrangements. Paid entertainments and expensive gifts highlight the party. More than one firm will spend as much as \$10,000 for this year's merriment.

"The most popular dates are the two weekends preceding Christmas," says Organization Services Co., Detroit, specialists in party planning for children. "For most effective building of good will, the party should be held in the plant," that organization adds.

Other Hints: Favored time for the party is Saturday afternoon. Presents should be divided into three or four age groups, and numerous adults should be present to control the rush at Santa.

Management is checking its Christmas list and cutting out one of the time-hallowed frills. Most firms agree that gifts to present or potential customers

have little to do with buying policy.

More Changes—Another casualty is the traditional Christmas turkey. While a few firms maintain the custom of giving birds to workers at Christmas, most companies say it's impossible to hand them out fairly.

Santa will go easier on cash bonuses, too. Associated Industries of Cleveland reports a 10 per cent decrease in the number of firms giving bonuses between 1953 and 1955. Smaller companies still hold to the tradition, but growing competition and new tax laws cut down the financial gifts.

Christmas Spirits—They still flow at office parties, but the more boisterous celebrations have been driven underground. Practice is for individual groups to get together on their own to toast the holiday.

Children aren't the only ones who will find their stockings stuffed. A West Virginia firm confides that presents to its truck drivers result in quicker deliveries in the next few months. And there will be plenty of overtime at double pay. Demand for steel and many fabricated articles is too heavy to allow producers time to catch their breath.

Good Neighbors — Industry's generosity isn't limited to workers and their families. Rockwell Mfg. Co., Pittsburgh, is typical of a growing number of companies which give presents to children's hospitals and charitable institutions rather than customers.

For most office workers, Christmas, 1955, offers a much-needed, three-day rest after a prosperous, but hectic, year. The Mondays after Christmas and New Year's Day generally will be observed as holidays. They will give purchasing agents a respite in their search for wide-flange beams.

U. S. Steel Hits State Tax

U. S. Steel Corp. has registered a complaint with the Pennsylvania Senate Finance Committee concerning a proposed state manufacturers' excise and use tax.

The tax bill (H. B. 1879), currently before the senate, would mean that manufacturers would have to pay an extra price on equipment made in Pennsylvania.

U. S. Steel's comment is typical of many industrialists in the state. C. F. Hood, president, says: "We submit that a business located in the state must join with other parts of that economy in financing the cost of state government." But under the proposed tax manufacturers will be at a definite competitive disadvantage by reason of higher costs.

"In view of the present unbalanced Pennsylvania tax structure, we believe a retail sales and use tax is the fairest and best revenue source," Mr. Hood concluded.

Railroads Get Write-Offs

The railroads continue to get the benefit of fast tax write-offs on their freight car and other rolling stock programs. Of the latest batch of 43 certificates issued by the Office of Defense Mobilization, railroads get 20. Their value: \$72 million; most of them are allowed at 85 per cent.

ODM says six of the certificates are for facilities involving small business. Other major permits were given for electrical generating plants and for research and development.

Lithium Weighs In

Suppliers predict increased demand for this lightweight metal whose low melting point and flexibility make it a natural for many industrial uses

LITHIUM, the lightest of all metals, is throwing its weight around.

Major lithium producers are big news on Wall Street, and a "Lithium Rush" is taking place in the U. S. and Canada. Production leaders have had to expand in recent years to overcome supply shortages and meet contemplated increases in demand.

Uses—Lithium is used as mineral, metal or as a constituent in compounds. Its long list of applications includes lubricants, ceramics, glass, metallurgy and welding. New, and relatively unexplored, is the field of organic-chemical synthesis (Grignard reactions).

A major consumer of compounds, and a growing one, is the porcelain enamel industry, where lithium is used to impart chemical durability and to lower firing temperatures required for nonwarping enamel application. This is particularly important now that porcelain enamel is receiving greater attention from architects as "curtain wall" finishes for buildings.

Metallurgy—Lithium appears to have a growing potential as an al-

loying constituent in the ferrous and nonferrous industries. Commercial acceptance has been retarded by economics, but the pricing trend seems to be more favorable.

Lithium salts are used in substantial quantities as fluxes for welding and brazing of aluminum. To some extent, the metal is used as an alloying agent for aluminum and magnesium, and it is used as a degasifier for nonferrous castings.

Greases—Multipurpose greases with a wide range of operating temperatures offer an expanding market—about 30 per cent of all greases made today are of this type. Next year, about 2 million lb of lithium hydroxide will go into multipurpose greases. Widely accepted in the automotive field, they are expected to make deep inroads in industrial lubrication.

Enthusiasm—Part of the furor about lithium comes from rumors that it may one day figure as a nuclear fuel. But the few nuclear experts who have commented on this say the use is still a question, not a fact.

Short-range possibilities clearly indicate the industry is not doing strictly in futures. Foote Mineral Co., Philadelphia, the leading lithium producer, made the first important move toward expanding facilities in 1953 with its plant at Sunbright, Va. Lithium Corp. of America this year started a \$10-million plant at Bessemer City, N. C. American Potash & Chemical Corp. expects to have its \$60-million lithium plant at San Antonio, Tex., going by the first of next year.

Outlook—L. G. Bliss, senior vice president, Foote Mineral, probably sums up industry feeling when he says: "We're not optimistic enough to believe that existing commercial markets for lithium and its compounds can support contemplated production. We do believe, however, that the technology of lithium is young, and it will mature through the multiple efforts of those wedded to its future."

Farmers To Spend \$24 Billion

Farmers will buy an estimated \$24 billion worth of electrical appliances and equipment in the next 20 years, reports the Rural Electrification Administration.

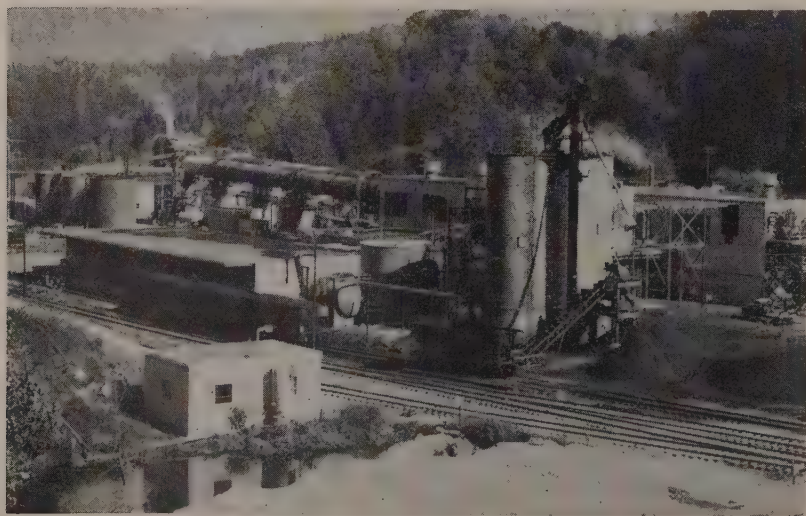
A recent REA study points out that purchases in the next five years will come to about \$5.3 billion; \$11.3 billion in the ten years after that.

The survey is based on estimates that power requirements of REA-financed systems will nearly double by 1965 and triple by 1975. It assumes there will be no major changes in income, prices and technology. The number of farms based on census definitions, will decline by 15 per cent in the next 20 years.

Lights and house wiring hold top place in estimated buys.

Household appliances, such as refrigerators, washing machines and television sets, follow closely. Electrical farm equipment comes farther down the list. Biggest items will be milk coolers and water pumps.

Top market area is California. Sales in that state for the next five years probably will reach \$2.5 million. Tennessee, Iowa and Ohio follow.



Foote Mineral Co.'s lithium processing plant, Sunbright, Va.

Nickel Storm Brews

ers assert famine comes in distribution patterns, not in shortage

TROIT platers are buying as much as 75 per cent of their nickel gray market prices—\$3.50 a pound. Legitimate channels are costing 92 cents.

Adding up the cost for plating industry representatives at their recent Detroit meeting, John Palik, president of the National Association of Metal Finishers, figures that gray market nickel is costing automakers a minimum of \$21 million this year. His maximum estimate—\$98 million.

Inequities—Some platers keep going by passing along the cost, he says, while others have been forced out of business. He believes that the gray market covers one-third to three-quarters of total nickel requirements.

Platers believe that the shortage is to be blamed on distribution patterns rather than on lack of material. Dr. Kenneth A. Graham of Crowley & Associates Inc., Allentown, Pa., feels an investigation of the sources of gray market nickel would prove illuminating. Suggestions—"Unfortunately our industry has inherited inequality of distribution from the Korean war," says Dr. Graham. "We require a much lower percentage of base period quantity than other nickel end-use industries."

Here are Dr. Graham's suggestions:

Dispel the idea that nickel plating isn't necessary and that others have satisfactory substitutes.

Obtain a realistic re-evaluation of present-day requirements of all the nickel end-use industries, and re-allocate accordingly.

Organize all users of nickel plating to support the program.

The meeting of key plating representatives in Detroit was the first step. Step number two will be in Chicago in January, when representatives will meet a congressional leader. They'll be asked for government investigation of the allocation setup.



Experimental aluminum engine blocks roll as . . .

Detroit Waits for Results

ALUMINUM die-cast engine blocks are being produced experimentally. Doehler-Jarvis Division, National Lead Co., reports that its new aluminum, straight-type, 6-cylinder engine block weighs about 50 lb as it comes from the die-casting machine, 43 lb when trimmed. It is some 132 lb lighter than gray iron units.

What It Means—Aluminum engine blocks will sell for about 10 per cent less than gray iron units, says Frank J. Koegler, National Lead's vice president.

The new block is being produced on a die-casting machine capable of handling dies up to 50 tons. This machine and the aluminum engine block are a joint project of the Kaiser Aluminum & Chemical Corp. and National Lead.

Rundown—The aluminum blocks can be diecast at a rate of 30 to

35 per hour on a single machine. At this speed, some 1700 lb of molten aluminum are used each hour. All 129 holes are cored and cast to size—no holes have to be drilled in the block.

These experimental units now will undergo intensive testing. Based on experience with them, development of a V-8 aluminum engine block is getting under way. The V-8 will weigh 70 to 75 lb.

Head of Sharon Steel Resigns

Henry A. Roemer Jr. has resigned as president and director of Sharon Steel Corp., Sharon, Pa.

His father, Henry A. Roemer, will take over the duties of president and will continue to serve as chief executive officer, board chairman and chairman of the executive committee.

Parceling Out Prosperity

Extension of federal aid to depressed areas is in the cards. Some \$50 million may be voted as a loan fund; technical assistance will be stepped up

CONGRESS has a sympathetic (and vote-minded) eye on the nation's "depressed" areas—parts of the country that are not sharing in the economic boom.

At last count (November) 19 of the nation's 149 major labor market areas had 6 per cent of the labor force unemployed. There were 74 smaller areas in the same boat.

Planned Action—What will be proposed in Congress next year is this:

1. Set up a new agency in the Commerce department. Suggested name: Federal Development Administration.

2. Provide about \$3 million to give technical assistance to depressed areas. Basically, this phase of the program will be an extension of work currently being done by the Office of Area Development, Business & Defense Services Administration, Commerce department.

3. Set aside a fund of \$50 million for loans to local industrial development groups. Federal participation in any loans, though, would be limited to about 25 per cent. Local groups will have to rely on their state government to get the rest. In fact, state participation will be a must before any federal loan will be granted.

Changes—The loan fund and the amount of funds available for technical assistance will be the big differences between the new agency and the present Office of Area Development (OAD).

OAD counsels industry on dispersal from prime target areas, assists communities in getting a development program started, helps firms find new products and new markets for products already made.

Co-ordinator—The office also co-ordinates information on federal aid and loan programs. It assists in the procurement of defense con-

tracts for firms in surplus labor areas.

It helps get additional tax amortization benefits for expansion-goal defense facilities that will be in depressed areas.

The activities come under the heading of technical assistance. They would be expanded if the proposed program were approved.

Outlook—Chances for approval apparently are pretty good, even though Congress turned down an appropriation request (for fiscal 1956) to increase the Area Development budget from \$120,000 to \$370,000.

It's election year now, and the depressed areas are in 79 congres-



Meet Edward F. Lickey: Consultant to Metalworking Equipment Division, Business & Defense Services Administration, he's working on speeding up the government's "trigger" program for machine tools.

With Motch & Merryweather Machinery Co. for 37 years, Mr. Lickey managed the company's Detroit office for 15 years preceding his recent retirement. He may be contacted in Washington at Room 4015, Commerce Bldg. Phone: STerling 3-9200, ext. 597.

sional districts (43 now held by Democrats, 36 by Republicans). Both sides have a vital interest in the program.

Here and There

More use of titanium in 1956 is the government's planning on. So the Business & Defense Services Administration has given producers a 90-day lead time to meet defense-rated orders.

One of the big reasons for action: Aircraft manufacturers haven't been giving enough lead time to suppliers of mill products. Quality has suffered. In some cases rush jobs were complete flops, and orders had to be rescheduled for future delivery because the first batch wasn't of high enough quality.

A side effect of the longer lead time is expected to be lower production costs, with eventual price reductions. Mills will be able to group small orders to be rolled at the same time and plan their inventory better.

Fourth-quarter export applications for copper and aluminum scrap can be submitted up to Dec. 16, says the Bureau of Foreign Commerce.

Previously, BFC has required fourth-quarter applications to be filed before Dec. 1. The new ruling applies to new and old aluminum scrap and remelt ingots as well as to new and old copper and copper base alloy scrap containing 40 per cent or more copper.

The Supreme Court is due to pass judgment on state right-to-work laws. Two test cases are coming up. The first is an AFL appeal against a Nebraska ruling that railroads cannot enter union shop agreements under the state law. This ruling declares that the Federal Railway Labor Act clause permitting union shops is unconstitutional in Nebraska. The second test will be an appeal from an opposite ruling by the North Carolina courts. If the Supreme Court upholds Nebraska, this ruling could be invalidated. Right-to-work laws are in effect in some 17 states.



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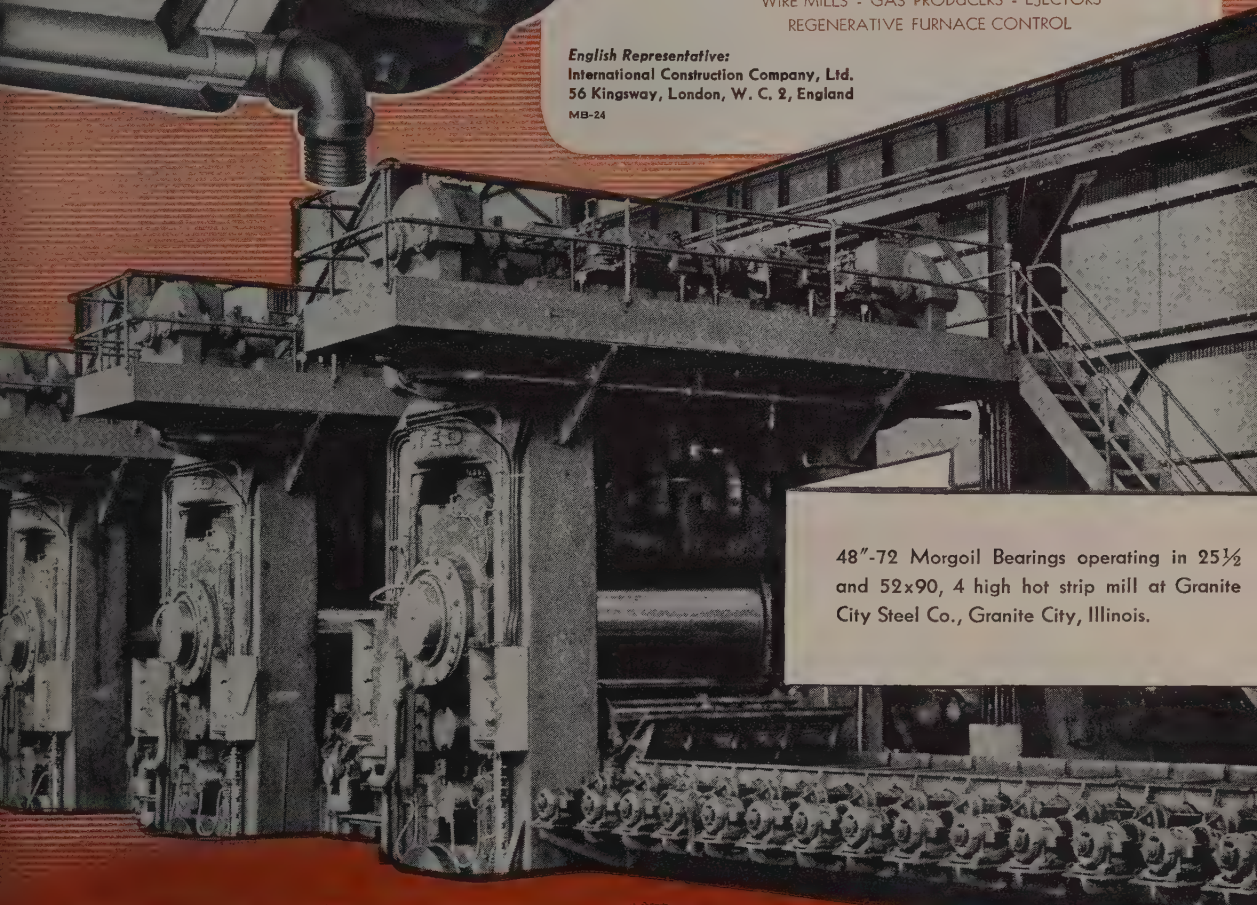
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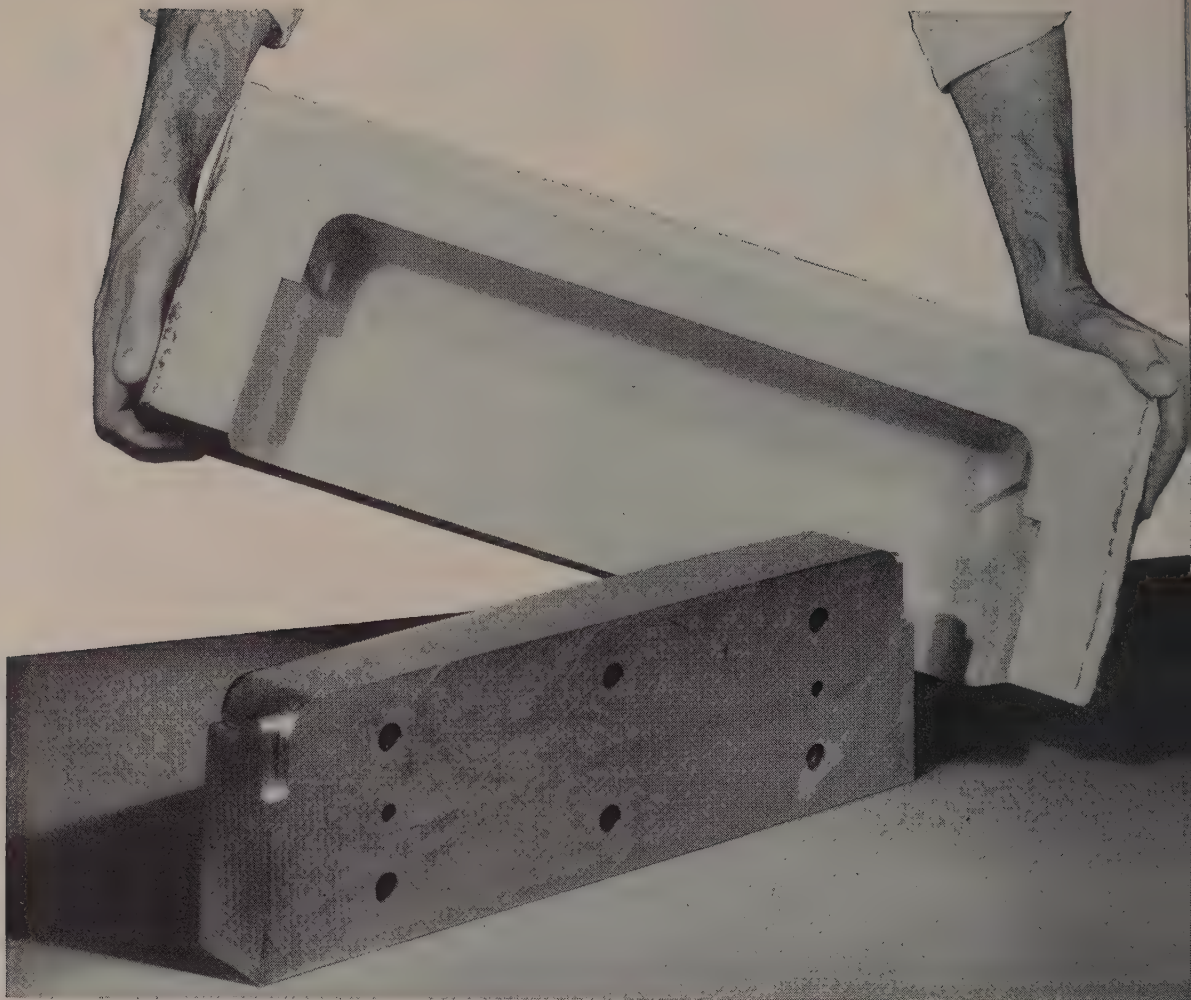
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Cast epoxy "Keller" Model shapes up 25% saving


"Rezolin" Toolplastik Compound for the concave die model shown here is the machined aluminum model around which it was cast. A "Keller" duplicate will be used to reproduce the plate model in steel. This method saves 15 days, with an estimated 25 per cent reduction in production costs. Based on BAKELITE Epoxy Resins, this tool compound is produced by Rezolin, Los Angeles 25, Calif.

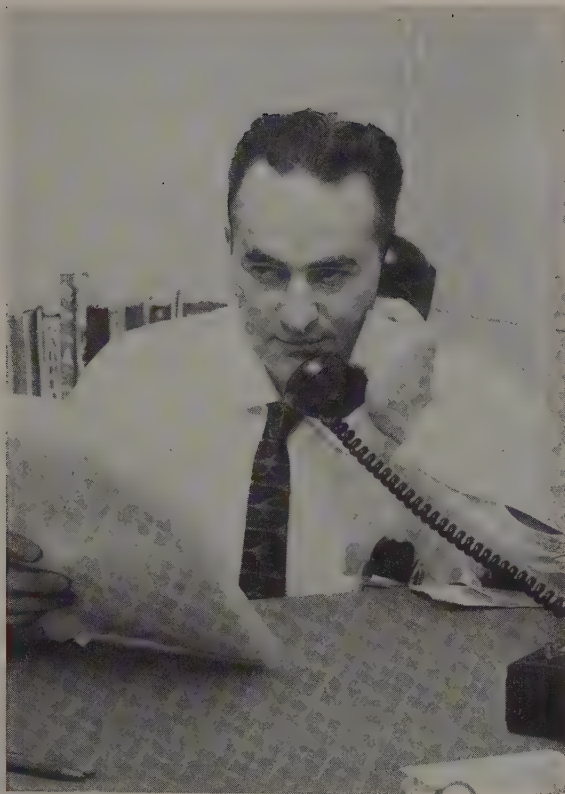
Savings in toolmaking time often reach impressive percentages when compounds based on BAKELITE Brand Epoxy Resins are used. Here are some of the reasons:

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- Outstanding dimensional stability
- Light weight means easy handling
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For further information, write Dept. LO-172.



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AiResearch's Young: Juggler of Parts

HOW DO YOU keep 14,000 kinds of parts for 1000 different products moving through the plant on schedule and without confusion? That's one of the jobs of Harris Young, factory manager, AiResearch Mfg. Co., division of Garrett Corp., Los Angeles.

To complicate the picture further, the products are sold to only one finicky customer, the aircraft industry. There's a demand for quality that he feels can't economically be purchased or subcontracted. It means AiResearch must continually add new processes to its plant—can seldom drop one. It also puts a new assembly into the works every other working day, takes one out of production at about the same rate.

A list of current products includes heat exchangers, electromechanical actuators, cabin pressure regulators, refrigeration systems and gas turbines.

Juggler—With parts and end products in a constant state of flux, he juggles schedules and facilities to maintain efficiency, avoid chaos. He has to take a host of widely diverse products, inherently costly, and insure his company a pro-

fit on the manufacture of all of them.

Part of the answer lies in delegating responsibility for quality widely. It goes beyond management and supervision to the operators. His is a business where it's economically sound to have a complete payroll of top-rate, skilled workers in every department.

Diversify—The big problem in being tied to aircraft, he feels, is that the cost of aircraft quality makes his company noncompetitive in other fields. Nevertheless, there must be an effort to diversify products to find new fields of application.

As an example, he cites some of the firm's air control systems which may find a niche in the chemical and petroleum industries.

A mechanical engineer from the University of Arkansas, his free time is spent with his family. A son, 12, and two daughters, 11 and 8, give him plenty to do. He's a Scoutmaster, a Cub Scoutmaster and a rabid manager of a Little League baseball team. He also shoots a "moderate" game of golf, scoring in the 80s. His home is in the Sherman Oaks section of the San Fernando Valley.



Modern French rolling mill helps boost steelmaking output

Boom in Europe—

France . . .

DESPITE the depressing effects of domestic politics and the difficult colonial situation, France is far from being the sick man of Europe.

Since 1938, industrial production has soared 70 per cent. It climbed 14 per cent in the last year. At \$2 billion, France's foreign reserves have doubled since 1954. She has boosted ingot production 70 per cent since 1948. It will hit 13.5 million tons this year. Over the same period, U. S. ingot production went up 32 per cent.

Prop—Steel is a mainstay. By midyear, domestic steel orders had piled up to 90 per cent above 1953's levels; export orders were up 70 per cent. There has been little slackening. To meet the demand, ingot capacity will be boosted 550,000 tons each year until 1960. Rolling mill capacity will

be hiked to 11.5 million tons a year.

Scrap prices are one of the major problems. In the last few months, they've jumped from \$28 to \$42 a ton. The full impact of this price squeeze is restricted to open-hearth steel, which amounts to only one-third of output.

Attitudes—On the surface, the automobile industry looks equally healthy. Output will be up 14 per cent from 1954, to 650,000 cars. But on many popular models, deliveries are extended two years. Yet two of the four major producers plan no large expansions.

Why? They say that France has one motor vehicle for every 14 inhabitants, maximum for present living standards. Colonial outlets promise to be more difficult to sell, and makers are not in love with the prospect of mixing it on equal terms with Britain, Germany and the U. S. for world markets.

Although 33 per cent of cars on the road are of prewar vintage, automakers still don't feel more capacity is necessary.

Focus — Railroad car builders confronted with semistatic demand have inspired a new inter-European society to speed standardization and modernization of rolling stock. It will purchase equipment, then lease it to interested railroads. Car export is getting a play. New orders are beginning to roll in, notably from India and Pakistan.

Shipbuilding, too, is going well. Norway has ordered a 20,000-ton tanker and U. S. lines have placed several contracts, including a 52,650-ton tanker. By the end of September, shipyards had committed more than 1 million tons with deliveries well into next year. The aircraft industry is another comer. It has been able to balance lack of capital against substantial offshore procurement from the U. S. Results: Know-how up with the best. Sales competition will soon be felt in world markets.

Helping Hand—Sometimes e

nic planning, Paris style, helps. There are still 230,000 farms in France big enough to use tractors that don't have one. The government allows a one-third refund on all gasoline used on the farms. It also has authorized the return of one-third the purchase price of any types of farm equipment, tractors included. Results: Tractor sales should reach 45,000. In 1953 they were 29,000. Tractor production has jumped to 60,000 from a prewar 200.

Plant and equipment originally bought on reconstruction loans are being put to good use by the construction industry. A project for harnessing the tides is under way at Dinard, on the channel coast. An Alpine hydroelectric project is on its way to completion. Overseas, French construction firms have won contracts for an airfield in Hong Kong, for the Australian Snowy Mountain project, for a dam in Iraq, and for dams and bridges and steel plants in Venezuela, Colombia and Uruguay.

Outlook—This revival of industry is the most powerful cohesive force in France. Given time, it could bring new stability to the economy and then to politics. Under the influence of farm mechanization, the rift between peasant and worker is losing its sharpness, with the promise that France may soon be able to take full advantage of her potential balance between industry and agriculture.

Short-term, France's strategic position as supplier to a booming Europe assures her of continuing gains. She'll have to find new world markets as her colonial buyers dwindle.

Belgium . . .

BELGIUM enjoyed a record year, with most metalworking industries operating near capacity. Outlook: Continuing gains in 1956. Steel production should hit 6.5 million tons, up almost 20 per cent from 1954. Production in the electrical industry is up 30 per cent, the machinery industry, 27 per cent. Metalworking employment is about 10 per cent from 1954.

Parallel—As in the U. S., Belgian economic gains have not been

made without important concessions to labor. Prices have held remarkably steady over the last several years. But the first important breaks came in July and November, when steel and coke industries were struck. Next year, labor's demands must force price increases. Trades unions are shooting for a 45-hour week and wage hikes.

Pressure is increased because unemployment is at its lowest level in seven years. In the iron and steel industry, the schedule calls for gradual work-week reduction starting in February. Almost certainly, mills will be forced to counter with offers of substantial wage increases—their deliveries are extended as much as eight months on some products.

However, a recent merger between John Cockerill, Ougree-Marihaye and Ferblatil, concentrates 45 per cent of Belgium's steel capacity in one company, and the manufacturer's bargaining position will be improved.

Exports—As much as any other European nation, Belgium depends on the export of manufactured products for her livelihood. Most metalworking industries have rung up good performances in 1955. Steel products are up 17 per cent over 1954; metalworking as a whole has gained 23 per cent.

Trade with the Netherlands is constantly increasing, with radio

products and auto assemblies leading the way. Exports to France are up 40 per cent, notably owing to increased sales of galvanized sheet and tin plate. Other important factors have been the common market established by the European Steel and Coal Community, increased re-exports of military equipment and bigger French purchases of spare parts for machinery.

Markets—Belgium has enjoyed increased trade with West Germany, in special machinery, armaments and subcontracting. Trade with the United Kingdom also is up, consisting mainly of semifinished products and consumer goods. Trade with the U. S. has remained relatively stable, with volume business being done in glassmaking machinery, wire products and armaments.

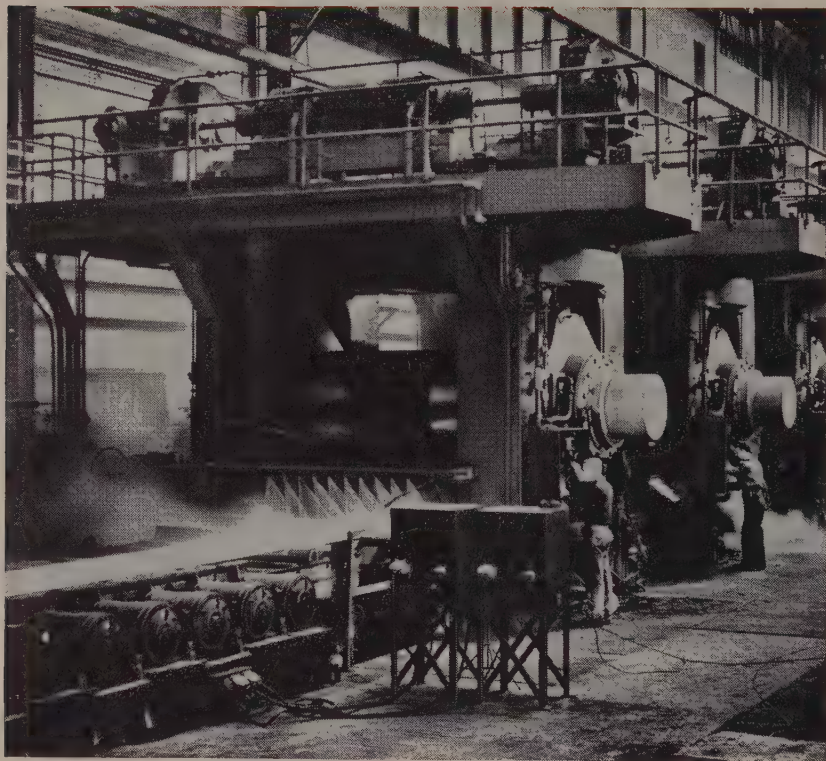
The concentration on overseas markets has paid off. Metalworking export sales are up to almost \$500 million a year. In 1956, organized labor will be after its share of the prosperity. The big question: Can costs be kept down?

These articles continue a series on the economic outlook in major European countries. Next week we will cover England and Spain.

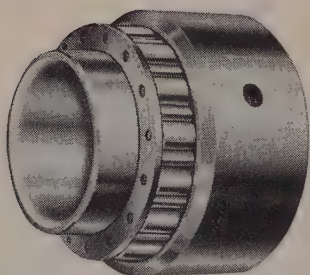


Passenger train gets tinsel touches in Belgian plant

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
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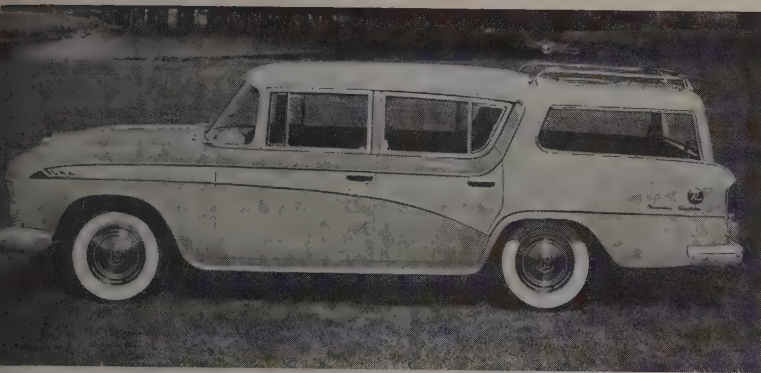
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AMC Counts on the Rambler

CK in 1902, the Rambler was the forte of what has today become American Motors Corp.

Revived in 1950, the Rambler is again assuming a position of key significance in the future of its maker. But let's start at the beginning.

History—It was about 18 months ago, you may recall, that Nash and Hudson formed American Motors Corp. The move followed a sales slump in 1953 which found sales dropping from 3.5 per cent to 2.2 per cent and Hudson from 1.7 per cent to 1.2 per cent. Both were losing dealers to the reduction. A major factor in the decision to merge was coming the dealer organizations. But more significant still was

the potential reduction in manufacturing costs. At the time of the merger, Nash had two bodies and Hudson had two, which added up to more than General Motors' three. One of the first benefits of the merger was the use of common tooling for Nash and Hudson bodies, with a resultant saving of \$15 million in 1955 model tooling, according to George Romney, American Motors Corp. president.

Example — Manufacturing and assembly operations were largely concentrated in Wisconsin with considerable reduction in overhead costs. A good example is in forgings which Hudson was buying from outside suppliers prior to the merger. After the merger, the Nash forge shop, which had ex-

cess capacity, began making forgings for both lines of cars at a lower cost for each.

Writing off the expense of obsolete Hudson tooling, inventories and commitments against a merger reserve, coupled with other consolidation costs, threw the company into the red. But in the middle of February, the company moved into the black, and people who might have thought of the firm as vanishing American have begun to take a new look at the organization.

Rambler — Those who haven't been looking will be hit in the eye with the Rambler for 1956, one of the more interesting gambits in the auto game this year.

American Motors Corp. is strongly sold on the virtue of the basic volume car. Dedicated to the everlasting credit of the masses, this car, in the opinion of American Motors, is the key to success of the full-line producers. For American this car is the Rambler, and ultimately it is planned that the car will comprise a cornerstone of a broad line.

Longer—At the time the car was revived in 1950, the wheelbase was 100 in. The first Rambler on a 108-in. wheelbase was the four-door sedan introduced in 1954, and it is interesting to note that in 1956 models all are on the 108-in. wheelbase. Despite what appears a concession to social pressure, the Rambler is offered as an answer to the bulky car. Adroit styling has lowered the car 1½-in. and reduced exterior width 2 in. Length has also been reduced 2 in. on some models.

But the remarkable thing is that this car appears conventional in size, compared with previous Ramblers which looked smaller. Moreover, this car with its smaller exterior dimensions is equal to the average Ford, Chevrolet and Plymouth in the composite of front and rear headroom, hiproom and shoulder room. Interior styling and appointments have been greatly improved and compare favorably with other cars in its field. And the air conditioning unit, previously

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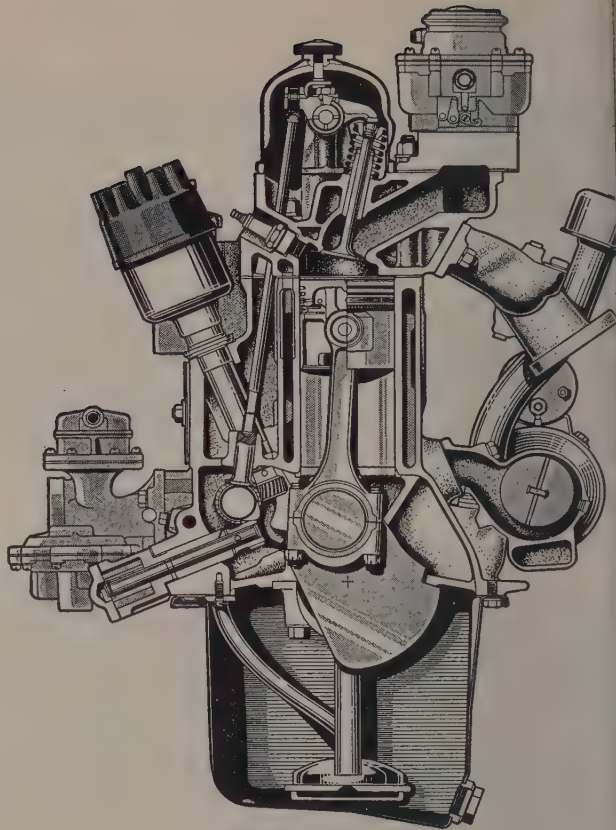
intruding into the legroom in the front, has been moved completely out of the way up under the cowl and on the firewall.

Test Drive—Perhaps the most outstanding feature to some, however, will come in test driving the Rambler. Distinguished by styling, which combines a roll-bar effect with excellent rearward visibility and unusual headroom in the rear seat, the practicality of the design must be experienced to be appreciated. Esthetic controversy to the side, this style treatment has definite functional advantages that mighty few style moves in recent years have been able to claim.

The Hotchkiss rear end has been replaced with a torque-tube drive which in combination with the unusual front suspension gives truly outstanding ride and bump recovery. And despite the use of relatively soft coil springs all around, the car displays impressive road holding and cornering characteristics.

Power—Acceleration with the new OHV engine is quite respectable, with 0-60 mph in about 14 seconds.

In connection with the engine, the term "new" is relatively accurate, but with some interesting history. As predicted, the unit is a conversion of the former L-head



The Rambler has a new engine, too—this OHV unit

engine to OHV design. While a new block casting is employed and the distributor is shifted to the opposite side of the engine, machine tools formerly used in the production of the L-head design are retained in the new mode. This is possible, since fundamental dimensions like bore spacing, diameter, etc., have not been changed.

Economy—The head, of course, is entirely new and, with the exception of the surface broach, is being made in pretty much new equipment. But the result is that Rambler upped its power 30 per cent with what in principle is a new engine through only about a \$2-million bill in tooling. The finished version turns out 120 brake horsepower compared with 90 bhp for the engine last year.

Another interesting bit of tooling sense is in the station wagon and sedan bodies. Both the hardtop and four-door version share sides in the sedan and station wagons. In other words, the four-door, hardtop convertible sedan and the four-door, hardtop con-

vertible station wagon are built with a common side assembly. In the station wagon, the extended roof panel and wagon-type rear are welded on; while in the sedan the conventional rear panels and deck are added.

Bargain—Total cost of the Rambler is pegged at \$21 million. Included is an increase in output capacity of 60 per cent. Rambler formerly built on the same final assembly line as the Hudsons and Nashes now have their own final line, with daily output pegged at 800 units.

Supplementing the new final line have been increases, particularly in Rambler body capacity throughout the plant.

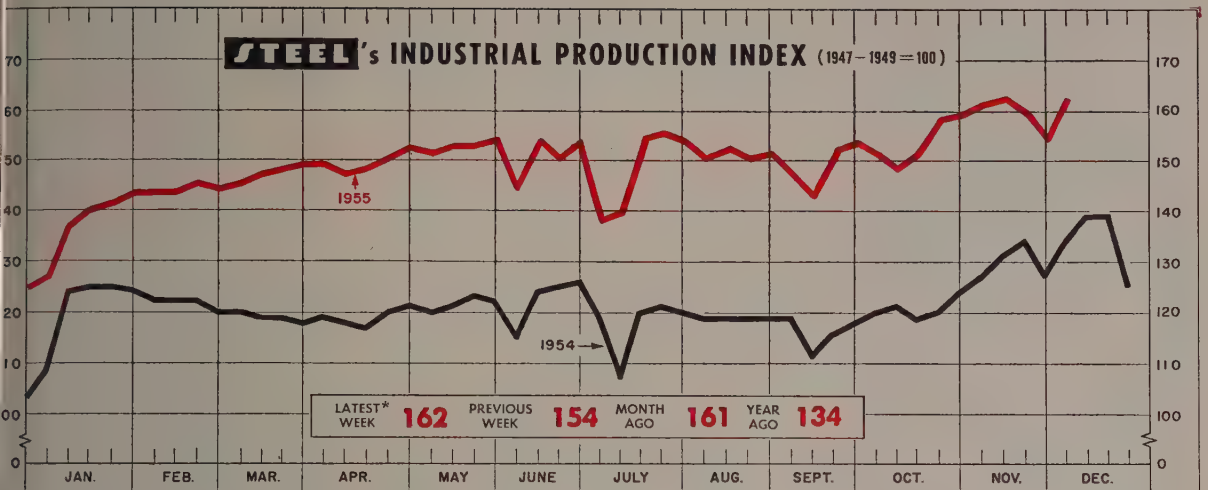
Demand?—That's to meet a demand expected to hit 150,000 in 1956. Dealers who had some reservations when George Romney predicted sales would double in 1955 over 1954 have seen the 35,000 sales of 1954 capped with 83,000 in 1955, up 130 per cent. And that was with a product only moderately changed over 1954's.

U. S. Auto Output

Passenger Only

	1955	1954
January	659,719	456,765
February	675,769	443,257
March	794,188	526,076
April	754,007	533,470
May	724,891	494,250
June	649,372	504,811
July	659,979	441,451
August	614,392	436,650
September	461,592	285,860
October	517,696†	236,635
November	748,559†	508,466
December	641,971	
Total	5,518,662	
Week Ended	1955	1954
Nov. 5	162,278	92,766
Nov. 12	180,754	116,285
Nov. 19	179,250	133,969
Nov. 26	151,799	111,910
Dec. 3	182,395†	144,995
Dec. 10	180,000*	148,692

†Preliminary *Estimated by STEEL
Source: Ward's Automotive Reports



Credit Curbs Won't Lower the Boom

BUSINESS is closing out the year with a rush and looking eagerly for 1956.

Credit restrictions won't dampen enthusiasm seriously; they may hold down spending enough to keep the boom going at a manageable pace.

Look Ahead — "Business volume at the beginning of 1956 will be running about 7 per cent higher than at the start of 1955, and current odds seem to favor a continued strong picture for the first half," asserts James M. Dawson, vice president and economist of Cleveland's National City Bank.

Mr. Dawson says that even if business eases in the second half, momentum from the first two quarters probably will make 1956 another record year.

Leveling Off — Credit will be slowing down in the next quarter though, as higher interest rates take effect. Loans currently outstanding indicate that the rate will still be strong, but new loans won't increase as much as they have.

Commercial and industrial loans have jumped almost \$2 billion since June 30, this year. Latest Federal Reserve Bank reports show these loans at \$28.8 billion. That's a \$4.4 billion jump over this time last year.

Future Funds—A lot of this money is going to meet current busi-

ness expenses, but some is earmarked for 1956 expansion plans—a sure sign that industry hasn't lost confidence in the future.

Consumer loans are up, too. Classified by the Federal Reserve System as "loans to individuals," this money, easy to get up to now, has jumped \$630 million since June, to put it at \$14.1 billion.

Discount Rates Up — Liberal credit rates have encouraged loans this year. But when the Federal Reserve Board of Governors upped the discount rate at its Cleveland and San Francisco banks from 2¼ to 2½-per cent (effective Nov. 18), borrowing slowed down.

Nonmember banks, and consequently, industrial and commer-

BAROMETERS OF BUSINESS

INDUSTRY

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
Steel Ingot Production (1000 net tons) ² . . .	2,384 ¹	2,356	1,958
Electric Power Distributed (million kw-hr) . . .	10,950 ¹	10,727	9,087
Bitum. Coal Output (1000 tons)	9,025	10,200	7,432
Petroleum Production (daily avg.—1000 bbl) . . .	6,855 ¹	6,859	6,270
Construction Volume (ENR—millions)	\$278.8	\$305.5	\$302.8
Auto, Truck Output, U. S., Canada (Ward's) . . .	217,701 ¹	181,089	171,177

TRADE

Freight Car Loadings (1000 cars)	770 ¹	677	662
Business Failures (Dun & Bradstreet)	209	205	226
Currency in Circulation (millions) ³	\$30,962	\$30,824	\$30,504
Dept. Store Sales (changes from year ago) ³ . . .	+10%	+6%	+2%

FINANCE

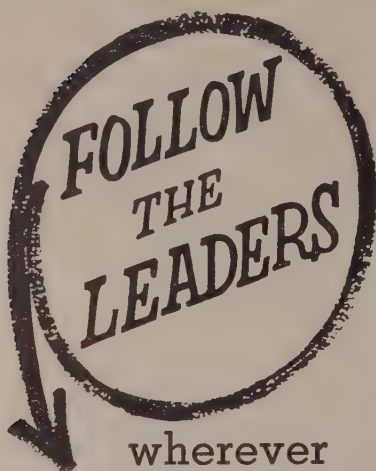
Bank Clearings (Dun & Bradstreet, millions) . . .	\$17,984	\$23,173	\$18,502
Federal Gross Debt (billions)	\$280,170	\$279,814	\$278,853
Bond Volume, NYSE (millions)	\$17,978	\$17,152	\$25,618
Stocks Sales, NYSE (thousands of shares) . . .	12,490	8,977	16,822
Loans and Investments (billions) ⁴	\$85,362	\$85,781	\$85,894
U. S. Govt. Obligations Held (billions) ⁴ . . .	\$29,962	\$30,377	\$37,411

PRICES

STEEL's Finished Steel Price Index ⁵	208.90	208.90	194.53
STEEL's Nonferrous Metal Price Index ⁶	265.9	265.2	217.4
All Commodities ⁷	110.1	111.1	109.5
Commodities Other than Farm & Foods ⁷	119.2	119.2	114.5

*Dates on request. ¹Preliminary. ²Weekly capacities, net tons: 1955, 2,413,278; 1954, 2,384,549. ³Federal Reserve Board. ⁴Member banks, Federal Reserve System. ⁵1935-1939=100. ⁶1936-1939=100. ⁷Bureau of Labor Statistics Index, 1947-1949=100

for stampings...



wherever
you are!



REFRIGERATION



AIRCRAFT



PHOTOGRAPHIC



ELECTRICAL



AUTOMOTIVE



HEATING—
VENTILATING

How can you go
wrong by following
the leading manu-
facturers of widely-
diversified products?

Many of them buy
their quality-stampings
from us ... and have
done so for years!

And their plants are
located ... literally
... from coast to coast.

So, if you want to
follow these leaders
to quality stampings...

You'll find a friendly,
talented and ideally-
equipped company
ready to give you a
warm welcome...

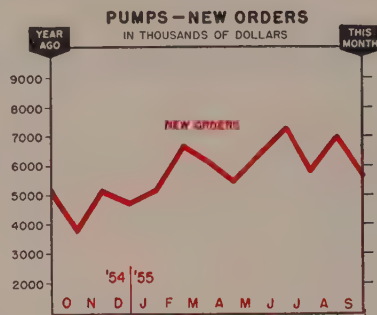
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• AMERICA'S BEST KNOWN
JOB STAMPING MANUFACTURER

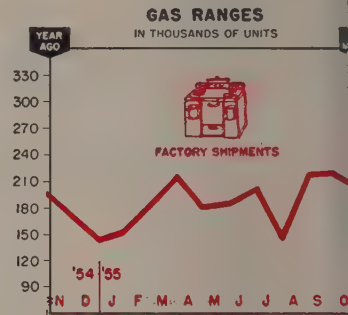
THE BUSINESS TREND



	1953	1954	1955
Jan.	5,220	4,057	5,752
Feb.	6,709	4,272	6,521
Mar.	6,161	5,093	8,255
Apr.	5,447	5,319	7,758
May	6,411	5,007	4,629
June	7,419	5,176	5,690
July	5,834	4,733	5,533
Aug.	7,022	6,706	4,886
Sept.	5,664	5,050	4,545
Oct. ....	.....	3,828	5,097
Nov. ....	.....	5,224	4,634
Dec. ....	.....	4,787	4,645
Total .....	.....	59,252	68,245

Hydraulic Institute

Charts copyrighted, 1955, STEEL



	1953	1954	1955
Jan.	152,900	137,000	189,200
Feb.	186,200	152,900	185,900
Mar.	217,300	188,200	208,200
Apr.	182,300	172,400	220,300
May	187,400	163,800	181,000
June	203,900	174,300	186,600
July	145,700	134,500	159,000
Aug.	218,600	179,400	186,800
Sept.	221,400*	203,900	209,500
Oct.	205,600*	197,100	203,900
Nov. ....	.....	174,000	158,500
Dec. ....	.....	147,300	134,400
Total ....	.....	2,024,800	2,183,300

Gas Appliance Mfrs. Assn.

*Preliminary

cial borrowers, now have to pay higher interest, with the result that loan activity will be slower starting into the new year.

Good Brake—Credit restrictions are helpful because more of next year's business will be done with earned, not borrowed, dollars. The big problem will be to maintain the delicate balance between tight credit, which would curb production, and overly liberal credit, which leads to inflation.

Mortgage Money Eases ...

Not everyone is happy about the credit clamps. Many builders and real estate agents feel that credit restrictions have had an overly severe effect on the housing industry.

Charles Wellman, executive vice president of the Glendale (Calif.) Savings & Loan Association, told a Senate banking subcommittee: "Government efforts to bring the credit boom under control were badly timed. Restrictive steps were necessary, but they should have come earlier."

But some relief is in sight. Home loan banks probably will have more stand-by credit available shortly, says Walter W. McAllister, chairman of the Federal Home Loan

Bank Board. This will help the building industry as it looks for a \$44-billion year.

Retail Sales Hit Record ...

Confident consumers are boosting retail sales to an all-time high this year. Dollar volume is expected to reach close to \$186.5 billion, 9.3 per cent above 1954 totals.

Christmas sales are indicating. Spurring along now, they probably will top last year's volume by 5 to 7 per cent. The reasons are obvious. Factory workers, for example, are making \$6.50 more a week than they did last year. Employment is running at record high rates (65.2 million), and installment buying has had free rein under a liberal credit policy.

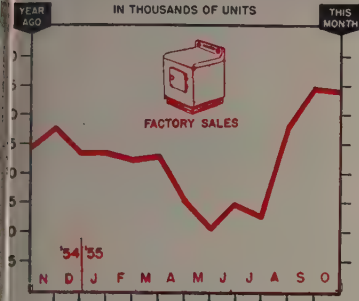
This attitude won't change much in the first part of 1956. In fact, consumer spending will go up maybe as much as \$11 billion this year. But the next few months should see a start toward less installment buying; more personal savings—especially if individual cuts do come true.

Skilled Help Wanted ...

Next year will see a great shortage of skilled labor as indus-

AUTOMATIC CLOTHES DRYERS

IN THOUSANDS OF UNITS



Factory Sales—Units

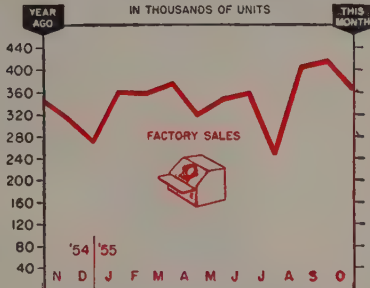
	1955	1954	1953
Jan.	357,354	249,956	277,309
Feb.	353,214	285,171	326,604
Mar.	370,555	307,862	315,989
Apr.	313,461	258,712	283,474
May	341,759	246,944	286,515
June	354,470	303,455	304,086
July	245,879	212,863	228,268
Aug.	403,770	293,243	291,260
Sept.	414,919	379,666	340,532
Oct.	362,335	339,169	310,467
Nov.	308,368	238,153	
Dec.		264,503	191,570

Totals ... 3,490,212 3,429,627

American Home Laundry Mfrs. Assn.

HOUSEHOLD WASHERS

IN THOUSANDS OF UNITS



Factory Sales—Units

	1955	1954	1953
Jan.	115,383	82,195	62,260
Feb.	109,215	62,488	57,136
Mar.	113,498	54,796	49,593
Apr.	73,978	37,661	28,556
May	49,228	26,533	32,867
June	70,616	30,297	32,749
July	60,516	40,755	33,296
Aug.	36,190	80,165	70,774
Sept.	169,905	107,044	86,461
Oct.	166,889	122,182	81,839
Nov.		138,254	78,167
Dec.		115,341	82,730

Totals ... 897,751 696,468

American Home Laundry Mfrs. Assn.

try continues to run at record rates.

Lower birth rates of depression years have caught up with the labor force, and there aren't enough trained men to go around. The current civilian labor force totals 67.3 million; only 2.1 million are unemployed.

A spokesman for Square D Co., Detroit, says: "There will be a continuing shortage of skilled workers." Chrysler Corp. reports a constant demand for 100 to 150 skilled workers over the last year.

First half of '56 most likely will see higher payrolls as skilled help puts in more overtime to meet production demands. It also means first and second quarter net profits may be slightly lower.

Replacement Parts Down . . .

The Automotive Parts Manufacturers Association reports its adjusted index of dollar sales of replacement parts is down 1.8 per cent in the third quarter, compared with second quarter of this year. Both quarters combined, however, exceed third quarter, 1948, a previous record.

Indications are that the fourth quarter will continue strong, but a downturn may be expected in the first quarter of '56 as high auto-

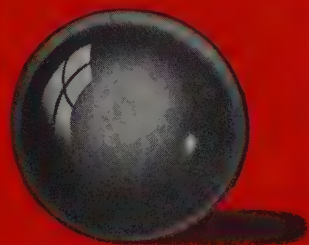
mobile sales of the last two years start eliminating the immediate need for repair parts.

Trucks have come in for some comments in the automotive field, too. *Ward's Automotive Reports* claims that independent truck producers have boosted dollar sales, but have failed to widen their bite of the domestic truck market.

With the growing need for commercial transportation, next year should see more trucks produced by Big Three makers, as well as smaller companies. Much of the output is expected to be in heavy-duty trucks.

Trends Fore and Aft . . .

Prudential Insurance Co. of America economists predict 1956 will see an increase of \$3 billion in business capital spending; \$13 billion rise in personal income . . . Salvatore Giordano, president of Fedders-Quigan Corp., Buffalo, N. Y., (air conditioners) claims: "There's room for sales of 1-million room units in the near future." . . . Scott-Atwater Mfg. Co. Inc., Minneapolis, reports a record smashing year for outboard motor sales. Third quarter shipments increased 255 per cent over a similar period last year.



COOLIDGE
Balls

**CHROME ALLOY
AND
STAINLESS**

**COOLIDGE CORPORATION
MIDDLETOWN, OHIO**



backing up

Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY

• to meet exacting
conditions exactly...there are
11 types to choose from

Carbon Steel Rolls
Ohioloy Rolls
Ohioloy "K" Rolls
Holl-O-Cast Rolls
Chilled Iron Rolls

Denso Iron Rolls
Nickel Grain Rolls
Special Iron Rolls
Nioloys Rolls
Flintuff Rolls

Ohio Double-Pour Rolls

THE OHIO STEEL FOUNDRY COMPANY

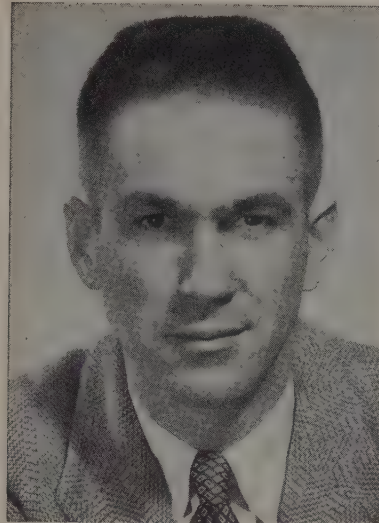
LIMA, OHIO • Plants at Lima and Springfield, Ohio



work roll



CHARLES E. RICE
... Jessop Steel executive v. p.



DONALD R. SCHOEN
... manager of the Hays division



GEORGE A. TIERNEY
... McAleenan Bros. general mgr.

Jessop Steel Co., Washington, Pa., elected **Charles E. Rice** executive vice president. Mr. Rice is also president of Jessop Steel of Canada Ltd. and vice president of Jessop Steel International Corp., subsidiaries. He has been vice president-sales for Jessop Steel for five years, and continues sales direction in addition to administrative responsibilities.

W. C. Whitehead, executive vice president, was elected president of Garrett Corp., Los Angeles. **J. C. Garrett**, president and founder of the firm, was elected chairman of the board.

Paul R. Minich Jr. was made general sales manager, materials handling division, Yale & Towne Mfg. Co., at Philadelphia. Formerly a Yale representative, he was president of Materials Handling Products Corp., with offices in Syracuse and Albany, N. Y. **Joseph J. Murray** was named to a new post, assistant general sales manager for the division.

Chris J. Witting, recently made general manager of consumer products, was elected a vice president of Westinghouse Electric Corp., Pittsburgh. He is in charge of the consumer product divisions.

R. G. Foster was elected president of Marshall Engineering Co., Santa Monica, Calif.

Donald R. Schoen, vice president-manufacturing, Hays Corp., Michigan City, Ind., was named manager of the Hays division. Vice President **Robert E. Navin**, who is in charge of engineering, also was named manager of the Metrotype division.

A. M. Thompson was made manager of Fabriform Metal Products, Los Angeles, division of George Getz Corp. He continues to handle sales and advertising.

Morris L. Hutchens was made chief engineer at Kearney & Trecker Corp., Milwaukee. He succeeds **Orrin W. Barker**, recently named vice president in charge of engineering. **Andrew K. Wilson** fills the new post of vice president-industrial relations.

Ray E. Eisenbies was named president of Sawhill Tubular Products Co., Sharon, Pa. He succeeds **Don Sawhill**, now chairman of the board, who had held both positions.

Fred P. Schliebner was named manager, quality control, Herbrand Division, Bingham-Herbrand Corp., at Fremont, O. He replaces **G. H. Fromer**, now factory manager of the division. Mr. Schliebner formerly was with the Willys-Overland Forge Division and Spicer Division of Dana Corp.

George A. Tierney succeeds **Charles Hoyt** as general manager of McAleenan Bros. Co., Pittsburgh. **Joseph L. Haley** was made director of sales engineering.

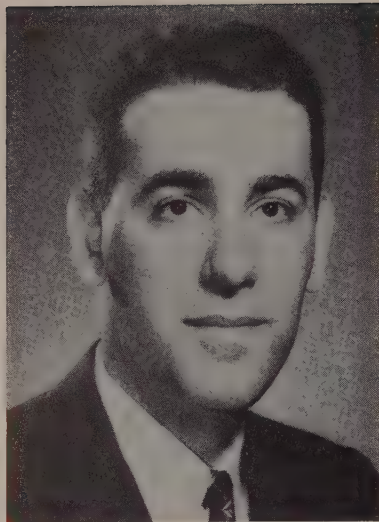
Harold N. Lang was appointed general manager of Wheeling Steel Corp.'s Benwood, W. Va., Works. He succeeds **Paul W. Koenemund** who was made chief engineer of the corporation.

W. W. Stewart was made assistant to the president, Industrial Fasteners Division, Oliver Iron & Steel Corp., Pittsburgh. **John H. Fulford Jr.** was appointed district sales manager in Ohio and **Kenneth A. Yaeger** sales representative.

Harry D. Myers has become associated with Towner Mfg. Co., Santa Ana, Calif., as a partner and general manager of operations. He was president of Cloyes Gear Works, Cleveland, and previously served in executive positions with Thompson Products Inc., Harry Ferguson Inc. and Standard Products Co.

Russell B. McNeill was elected vice president of administration at Houdaille Industries Inc., Buffalo. Houdaille-Hershey Corp. was renamed Houdaille Industries Inc. on Nov. 30.

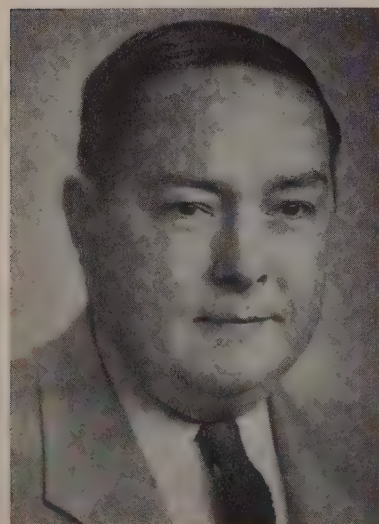
Philip F. Hartung was made east-



SETRAK K. DERDERIAN
... vice president of Metal Hydrides



JEFF H. HOWELL
... supt. at Republic's Warren, O., plant



GEORGE R. ANDERSON
... Weatherhead industrial equipment sales

ern regional sales manager of Rigidized Metals Corp. He is at Bergenfield, N. J.

Robert J. Niederhauser was named to a new post of manager-sales engineering for **Harris-Seybold Co.**, Cleveland. Associated with the company for 16 years, he has been lithographic product manager since 1953.

Setrak K. Derderian, general manager, was elected vice president of **Metal Hydrides Inc.**, Beverly, Mass.

Donald W. Games was made sales engineer for **Production Machinery Corp.**, Mentor, O. He was a project engineer with **Wean Equipment Corp.**

Jerry T. Atkinson was elected president and general manager of **Alloy Products Corp.**, Waukesha, Wis., to succeed the late **W. J. Wachowitz Sr.** **Walter J. Wachowitz Jr.** was named vice president and general sales manager. **Earle W. Hardy** was elected secretary, **Walter A. Sherman**, treasurer.

Edward G. Merk was elected vice president - sales at **Benchmaster Mfg. Co.**, Gardena, Calif.

Jeff H. Howell was made superintendent of hot strip finishing at the Warren, O., steel plant of **Republic Steel Corp.** **A. F. Prust** was named chief metallurgist.

R. W. Johnson and **Irving C. Maust** were elected vice presidents of **Foote Bros. Gear & Machine Corp.**, Chicago. Mr. Johnson is sales director for the industrial gear division. Mr. Maust is sales director for the precision gear division.

Thomas Linder Jr. was appointed manufacturing manager, **Chandler-Evans Division**, **Pratt & Whitney Co. Inc.**, West Hartford, Conn.

George R. Anderson was appointed sales manager for original industrial equipment at **Weatherhead Co.** He will have headquarters in the newly established division general offices at Ft. Wayne, Ind.

General Electric Co. named **Howard M. Perry** manager-product services and **F. C. Miller** manager-marine sales in its small turbine and supercharger department at

Fitchburg, Mass. Mr. Perry replaces **John H. Reynolds Jr.**, now manager - services engineering practices, installation and service engineering department at **Schenectady, N. Y.**

Taylor-Wharton Iron & Steel Co. division of **Harrisburg Steel Corp.** **High Bridge, N. J.**, appointed **Carl A. Read Jr.** as sales engineer in charge of its New England territory.

Charles H. Luikart was made assistant district sales manager of **Cleveland district office, Kaiser Aluminum & Chemical Sales Inc.** He was manager of the Boston branch.

Tom Pearson was made manager of the Houston district office of **Lone Star Steel Co.** He succeeded **B. C. Robertson**, now manager of the firm's oil country goods sales.

E. W. Bliss Co., Salem, O., appointed **Edmund Shuster** chief European sales engineer, rolling mill division, to replace the late **D. H. Montgomery.** From headquarters at the Bliss French subsidiary in Paris, he will direct sales and service engineering for rolling mill and allied equipment, as well as mill rolls and tube straighteners for Bliss' Mackintosh-Hemphill Division.

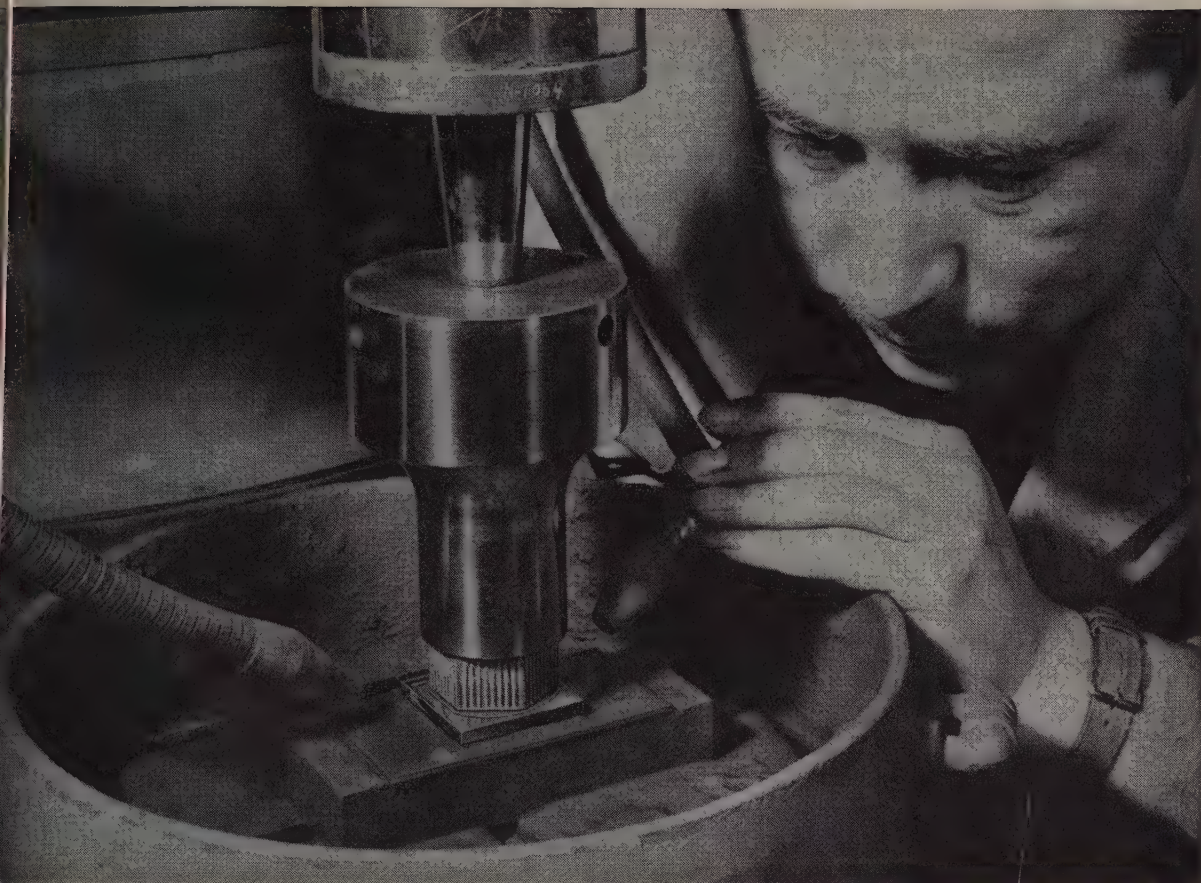
Glenn H. Parker was made district sales manager in northern New York state for **Republic Steel Corp.'s Berger Division.** He is in Albany.

Willard F. Bierman was made manager of sales and engineering of **Madison Industries Inc.**, Big Rapids, Mich. He was chief engineer of **Madison Mfg. Co.** at Muskegon, Mich.

Charles T. Schwarz was made Chicago branch sales manager for **Yale & Towne Mfg. Co.** He replaces **Roy L. Wolter**, recently made general manager of **Yale Towne's Automatic Transportation Division, Chicago.**

H. H. Butts was appointed sales engineer for the Chicago area for **International Rustproof Corp.**

Edgar W. Engle was made technical



using the Sheffield-Cavitron Ultrasonic Machine Tool to dice germanium in the mass production of transistors. The tool itself consists of 271

pieces of Superior's 18-gage Type 304 needle tubing, cut to $\frac{7}{8}$ " lengths and silver brazed into a single tool, permitting tolerances as fine as .0005".

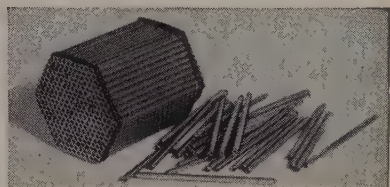
NEW ULTRASONIC MACHINE TOOL USES TUBING TO CUT HARDEST, MOST BRITTLE MATERIALS KNOWN

new application for Superior Tubing

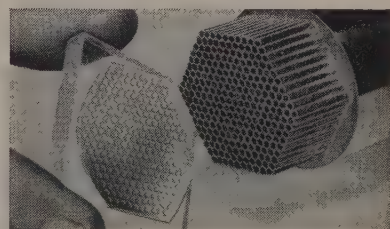
Ultrasonic vibrations do the cutting with this new machine tool, invented and developed by the Cavitron Equipment Corporation, Long Island City, N.Y. In the Cavitron process, a tool is used which has the precise shape of the cavity desired. Finely divided abrasive particles suspended in water are allowed continuously across the work. No movement or vibration is visible when the machine is switched on, although the tool vibrates 20,000 times a second through a stroke of .0035". The vibrating tip activates the suspended particles, and microscopic chips are gently excavated without heat, noise or vibration. The tool sinks swiftly into the work under slight pressure, forming a cut or cavity of exactly the same shape as the tip.

Tools made of Superior tubing save considerable cutting time on relatively large areas. Furthermore, the slender walls (.005" thick) minimize waste of valuable raw material. Cavitron engineers first used carbon tubing for this purpose, but in consultation with Superior engineers switched to AISI Type 304. This material has twice the life of carbon tubing, with much greater resistance to wear. Most important, it resists warping at the silver brazing temperatures needed to join the tubes together.

Your files should contain Superior Bulletin No. 40. It lists over 55 types of available material, including the stainless steels, with valuable selection and application data. Write for your free copy today. SUPERIOR TUBE COMPANY, 2005 Germantown Ave., Norristown, Pa. *On the West Coast:* Pacific Tube Co., 5710 Smithway St., Los Angeles 22, California.



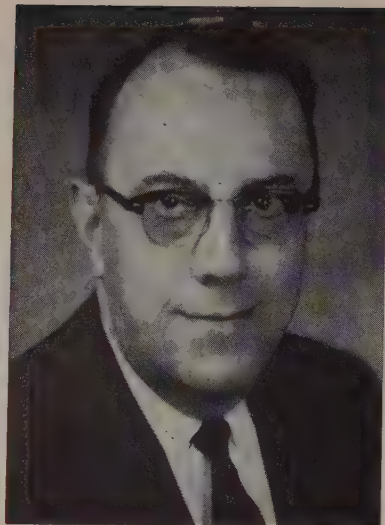
Superior tubes are cut into 2" lengths and silver brazed into a 6-sided tool, which is then cut in half and two complete honeycombed tools formed—each $\frac{7}{8}$ " deep. Similar tools are used to cut precision jewel bearings.



Closeup of tool and work shown in top picture. The Cavitron makes it possible to cut and drill intricate shapes in materials which, because of their fragility or sensitivity to sudden temperature changes, would be impossible to work on a production basis.

*All analyses available
in .010" to $\frac{1}{8}$ " OD;
certain analyses in light
walls up to $2\frac{1}{2}$ " OD*

Superior Tube
The big name in small tubing



MARVIN L. STARK
... Peerless Mfg. vice president



J. R. FERGUSON JR.
... U. S. Steel asst. v. p.-engineering



WARD W. CLARKE
... S. P. Kinney Engineers v. p.

cal director of **Vascoloy-Ramet Corp.**, Waukegan, Ill.

Marvin L. Stark was elected vice president, engineering and development, **Peerless Mfg. Corp.**, Louisville. He was director of engineering.

Roger A. Nagan succeeds **Earl F. Lowe Jr.** as superintendent of coke ovens for **Interlake Iron Corp.**'s Duluth plant.

Allis-Chalmers Mfg. Co., Milwaukee, appointed **J. D. Harmison** parts sales manager for the tractor group. He is succeeded by **Frank Jones** as tractor sales manager, farm equipment division.

George W. Herman was made assistant plant manager at Bridgeport, Conn., for **American Chain & Cable Co. Inc.**

J. R. Ferguson Jr. was appointed an assistant vice president-engineering, **United States Steel Corp.**, Pittsburgh. He is succeeded as chief engineer-project development by **P. S. Weaver**.

Howard L. Young was elected a vice president of **American Zinc, Lead & Smelting Co.**, St. Louis. He was appointed vice president of **American Zinc Sales Co.**, subsidiary, in 1954.

J. P. Cody was made manager, industrial division, **J. I. Case Co.**, Racine, Wis. He succeeds **George W. Iverson**, retired.

Frederick C. Borel III joined **Arthur G. McKee & Co.**, Cleveland, as sales engineer in the industrial engineering division. He held a similar position with **H. K. Ferguson & Co.**

Ward W. Clarke was elected vice president in charge of engineering at **S. P. Kinney Engineers Inc.**, Carnegie, Pa. He is succeeded as chief engineer by **Hugh B. Carr**, formerly associated with **Steel Corp. of Canada Ltd.**

John F. Karr was appointed manager of market research by **Truax Co.**, La Crosse, Wis.

Robert F. Schutz was promoted from manager to vice president and manager of **Borg - Warner Corp.**'s **Ingersoll** Kalamazoo, Mich. division.

Richard Smucker was made project engineer with **E. W. Bliss Co.** rolling mill division, Canton, O. He was an engineer in the **Salerno** O., plant. **Tom A. York** was made sales engineer of the press division in the **Rochester, N. Y.**, territory.

OBITUARIES...

William A. Peterman, 73, vice president and general manager, **Gal-land-Henning Mfg. Co.**, Milwaukee, died Nov. 26.

William C. Epstein Sr., 63, general manager, **Miami Foundry Co.**, Miamisburg, O., died Nov. 24.

Alexander Primas, 59, former owner of **Primas Tool & Die Shop**, Buffalo, died Nov. 22.

David N. Hughes, 84, former gen-

eral superintendent, **Baldwin Locomotive Works**, Eddystone, Pa., locomotive division, died Nov. 15.

Frank K. Metzger, 64, former vice president and general manager, **Standard Steel Works Co.**, Burnham, Pa., subsidiary of **Baldwin Locomotive Works**, died Nov. 17.

Joseph H. Sherman, 52, vice president and treasurer, **A. Sherman Mfg. Co.**, Stamford, Conn., died Nov. 23.

Robert S. Andrews, 61, president

of **Monarch Laboratories**, Utica, N. Y., died Nov. 18.

Allen E. Chester, 54, vice president, **Promat Division**, **Poor & Co.**, Waukegan, Ill., died Nov. 20 while en route to Honolulu.

Ralph J. Knerr, superintendent, alloy and tool steel division, **Bethlehem**, Pa., plant of **Bethlehem Steel Co.**, died Nov. 23.

John J. Carson, 41, owner of **Carson Metal Products Inc.**, Unionville, Conn., died Nov. 24.

Slugger "Pinch-hits" for Battering Ram...

SAVES \$13,000...

Six men spent 21 hours removing nuts from 54 five-inch diameter bolts on this hydro-generator rebuilding job. An 800 lb. battering ram was used to remove the nuts, which held three drive shaft couplings together between water wheel and generator.

It took seven men another 24 hours to tighten the same nuts with the battering ram. Down time on the generator cost \$300 per hour. The problem was how to run the nuts faster and with less manpower.

AIR engineering was put to work. A Size 588 Slugger Impacttool "pinch-hit" for the battering ram. Two men then removed all the nuts in 1¾ hours, and put them on again in 2 hours, saving 286½ manhours and 41¼ hours down time. With nearly \$13,000 saved on its first job, the Slugger now has a "full-time" job.

If you in any way influence production or maintenance cost-savings in your plant, it will pay you to see I-R's confidential manual of reports on "AIR engineering at work". Write on your company letterhead, and we'll make arrangements for you to see it soon.

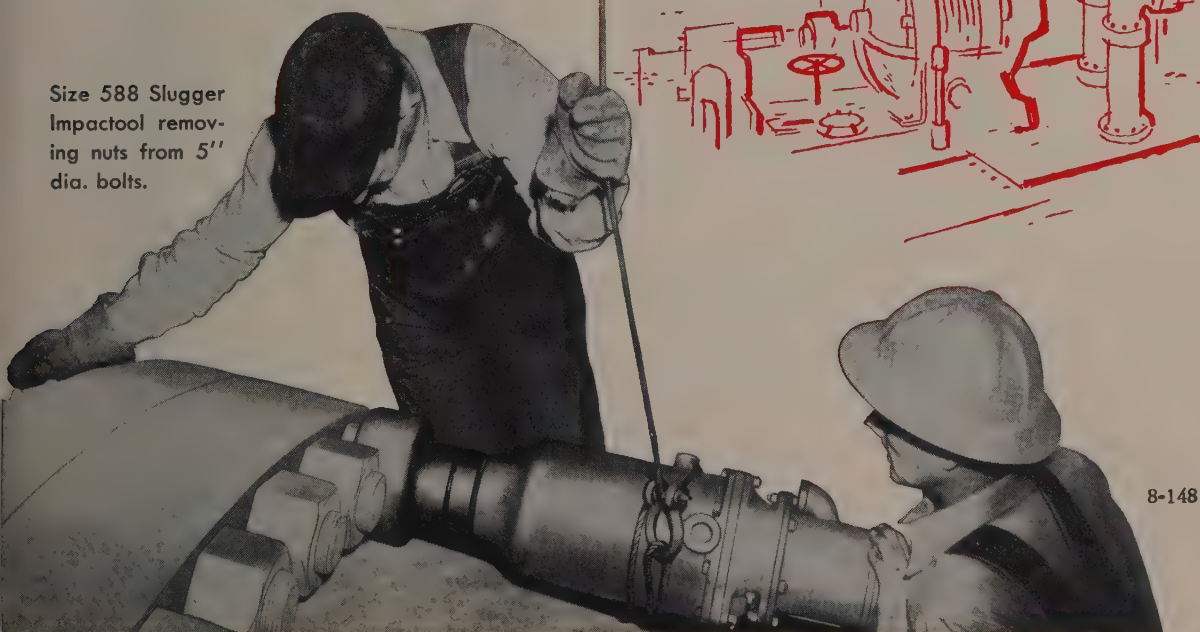
AIR engineering Manual

Over 100 interesting and helpful case history applications of AIR engineering at work.

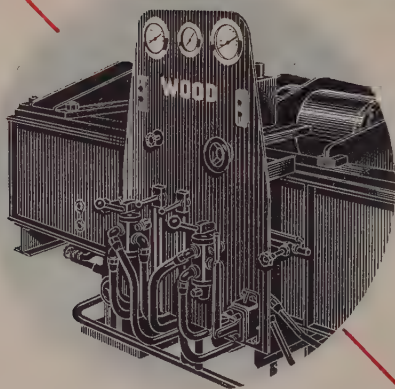
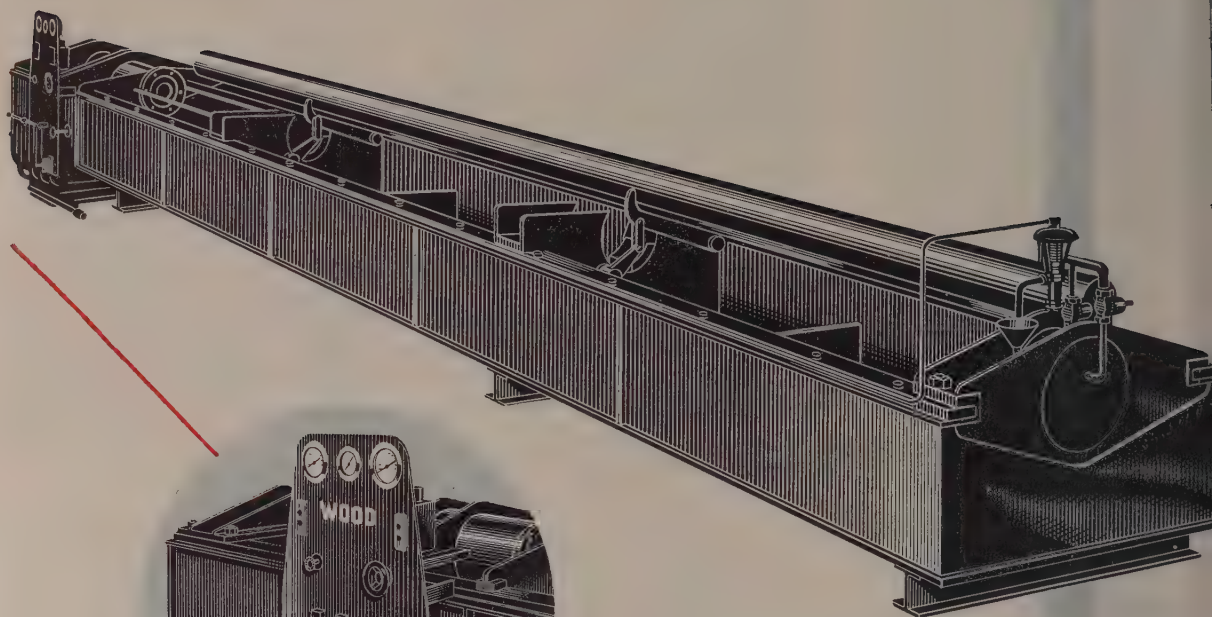
Ingersoll-Rand

11 Broadway, New York 4, N. Y.

Size 588 Slugger Impacttool removing nuts from 5" dia. bolts.



8-148



Hydrostatic Tube Testing Machine
designed for the hydrostatic
testing of tubes of
4½" to 12" nominal sizes and in
maximum lengths of 35'.
Test pressures range from
700 to 1500 psi. Write for catalogs
of our hydraulic equipment.

R. D. Wood Hydrostatic Tube Tester

"... that industrial equipment which has maintained
high excellence in manufacture will continue to be sold,
and will contribute its worth to uplifting the general
quality of everything produced in industrial America..."

R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING, PHILADELPHIA 5, PA.



HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ALLEVIATORS • INTENSIFIERS

Foundry Expands

A multimillion program at Central's Alabama plant includes addition of continuous casting machinery

CENTRAL Foundry Co., Newark, N. J., is spending \$2 million for further mechanization and expansion of its plant at Holt, Ala. Including this project, the company has spent \$7.5 million for improvements since World War II, says J. Nolan Jr., president.

The new program calls for the addition of continuous casting machinery for 2 and 3-in. cast iron oil pipe. Other expenditures will be for further mechanization of manufacturing processes and materials handling.

Outstanding among the earlier improvements are: Origination of the centrifugal method (Nolan process) for making cast iron oil pipe; a new foundry exclusively for producing machine-made oil fittings; and a new plant for manufacturing fiber pipe, the latest product added to its line.

Plant facilities at Holt now consist of six foundries and 15 auxiliary plants for utility services, production, research and storage.

Detroit Valve Co. Formed

Anderson Brass Co., Detroit, acquired part of the assets of the Brass Division, Detroit Brass & Malleable Co., that city, producer of gas cocks, valves and fittings for appliances. The property will be used to form the nucleus of a new company, Detroit Valve Co., which will be operated as a wholly owned division of Anderson Brass. E. C. Anderson is president of both companies. E. R. Anderson is executive vice president and assistant general manager. E. E. Anderson is vice president in charge of all production and purchasing of the two companies.

Atrax Co. Expanding

Atrax Co. is adding more space and equipment at its Newington, Conn., plant. The firm is adding 10,000 sq ft of plant area and is increasing its special service facilities. The company makes solid tungsten carbide tools.



"Torture" Chamber Knocks "Whiskers" Off Nails

The iron maiden of medieval days had nothing on this torture chamber which is getting finishing touches at U. S. Steel's Johnstown, Pa., Works. This 8000-lb device removes the finlike formations on newly made nails before being packed for shipment. The "whiskers" fall through the small holes in the cylinder as it rotates to condition the nails for final cleaning and polishing

Vitro To Build Laboratory

Vitro Laboratories, a division of Vitro Corp. of America, New York, will build a \$1-million laboratory near Silver Springs, Md., to replace leased facilities in that city. Vitro Corp. mines, processes and refines uranium; recovers rare metals; does chemical and physical research; develops processes, instrument and equipment systems; operates test facilities; manufactures ceramic colors and chemicals; designs and engineers processing and manufacturing plants and other technical facilities.

Ford Starts Plant Project

Ford Motor Co., Dearborn, Mich., has started construction of an automatic transmission plant in Sharonville, O., near Cincinnati (see STEEL, July 4, p. 64). Construction is expected to be completed by January, 1957, while production is scheduled to begin during the latter part of that year. This plant, part of Ford's \$3,750,000,000 postwar expansion, modernization and tooling program, will not affect current company automatic transmission production

at the division's other facility in Fairfax Village (an eastern suburb of Cincinnati), or at the division's headquarters plant at Livonia, Mich.

Punch Press Firm Expands

Kenco Mfg. Co., punch press firm, is doubling its plant area at 5211 Telegraph Road, Los Angeles 22, Calif. Expansion includes increased production facilities and the development of automatic and semiautomatic mass production processes in the manufacture of small punch presses. Also on Kenco's agenda for 1956 are new, advanced presses designed for integration into mechanized production systems.

Diecaster Enlarges Facilities

Accurate Die Casting Co., Cleveland, producer of aluminum, zinc and magnesium diecastings, has added 23,500 sq ft of space to its manufacturing area. One new plant with 4000 sq ft is devoted to magnesium diecastings; another, with 11,000 sq ft, is for production of aluminum diecastings; ex-
(Please turn to page 86)

another revolutionary development by La Salle

THE **NEW**

... gives

HIGH STRENGTH.

"FATIGUE-PROOF" steel bars offer high strength in-the-bar . . without the expense and trouble of heat treating. Tensile strength is in the 140,000 to 150,000 p. s. i. range . . hardness which is related to this strength level is approximately 30 Rockwell "C."

"FATIGUE-PROOF" has uniform strength across the bar . . no soft centers. (This uniformity is maintained from bar to bar . . lot to lot.) This remarkable uniformity of strength makes "FATIGUE-PROOF" ideal for applications in the 140,000 to 150,000 p. s. i. range that formerly required heat treated carbon and alloy steels, either hot rolled or cold drawn.

With "FATIGUE-PROOF" you'll get the advantages of heat treating . . none of the disadvantages. In short, you'll get a better part at lower cost.

... yet it's

EASY TO MACHINE

"FATIGUE-PROOF" is a free-machining steel bar . . without question. It machines at least 25% faster than annealed alloys . . 50% to 100% faster than heat treated alloys.

"FATIGUE-PROOF's" excellent machinability permits faster speeds, heavier feeds, better tool life . . your production rates will increase . . you'll get more parts per hour.

Distortion from machining is held to a minimum . . there is no reduction of tool life due to the higher speeds and heavier feeds . . and surface finish is greatly improved.



La Salle **STEEL CO.**

1414 150th Street, Hammond, Indiana

Manufacturers of America's Most Complete Line
of Quality Cold-Finished Steel Bars



STEEL BAR

WITHOUT HEAT TREATING

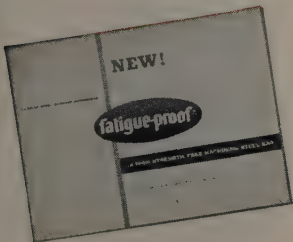


- *no quench cracks*
- *no distortion from heat treating*

With heat treating eliminated, the problems that accompany heat treating are avoided. Quench cracks become a thing of the past. Distortion and warpage from heat treating don't occur . . . consequently time consuming and costly straightening and cleaning operations are not necessary.

You eliminate not only the cost of heat treating but also its disadvantages.

If you have parts where strength is a requirement . . . you can save money and get away from problems by using "FATIGUE-PROOF." Our Sales Engineers will be happy to show you how this can be accomplished and provide samples for test purposes.



JUST PUBLISHED! Ask for your copy of the new 20-page booklet which gives additional information on the remarkable new "FATIGUE-PROOF."

LA SALLE STEEL CO.

1414 150th Street
Hammond, Indiana

Please send me your "FATIGUE-PROOF" Bulletin.

Name _____

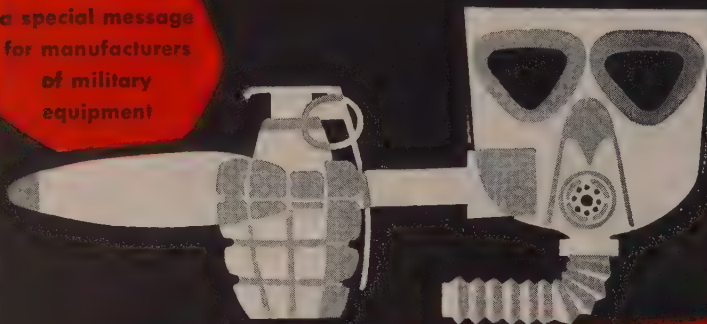
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for manufacturers
of military
equipment



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ON MAGNESIUM Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

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Manufacturers of Iridite Finishes for Corrosion Protection and
Paint Systems on Non-Ferrous Metals, ARP Plating Chemicals.
WEST COAST LICENSEE: L. H. Butcher Co.



(Concluded from page 83)

isting tool and die room facilities have been increased 8500 sq ft.

Expands Machinery Division

Clark Equipment Co., Buchanan, Mich., is expanding its Construction Machinery Division plant at Benton Harbor, Mich., by 50 per cent (125,000 sq ft). The company has just opened a new headquarters administrative building. It climaxed a 100,000-sq-ft expansion program started nine months ago.

Snyder Acquires More Space

Snyder Tool & Engineering Co. has purchased a building at 103 McDougall, Detroit, close to its main plant at 3400 E. Lafayette Ave. The expansion is the result of pressing requirements for adequate warehouse facilities to speed the building of huge, automated special machine tools.

Landis Machine Enlarges Plant

Landis Machine Co., Waynesboro, Pa., is erecting an 11,250 sq-ft addition to its Tap Division building. It will house the research department and the newly created thread roll die department.

Republic Forms Service Unit

Republic Steel Corp. establishes an International Projects Division to handle increasing demands from foreign industries for technical engineering and manufacturing know-how. David H. Bellamore is division director, with offices in the Chrysler building, New York. L. I. Underwood succeeds Mr. Bellamore as general export manager effective Jan. 1.

Machinery Firm Boosts Capacity

Poor & Co.'s subsidiary, Pioneer Engineering Works Inc., Minneapolis, purchased the Como avenue plant of Minneapolis-Moline Power Implement Co. in that city and the adjoining plant of United States Air Conditioning Corp. The two properties have more than twice the facilities Pioneer had at its former location. The acquisitions are part of Pioneer's \$2-million ex-

sion program which will include such improvements as modern machines and equipment at new location. The company makes machinery.

American Chain Enlarges Plant

American Chain & Cable Co., Bridgeport, Conn., will build addition to its factory at Adrian, Mich. It will add about 500 sq ft of working space, making a total of about 200,000 sq ft of plant control. Costs: About \$10,000 for the addition and \$53,000 for new equipment. The plant makes automobile emergency brake controls, aircraft controls, stainless steel aircraft terminals and heavy-duty emergency brakes.

Houdaille Changes Name

Houdaille Industries Inc. is the new name of Houdaille-Hershey Corp., Buffalo. In addition to a wide diversity of products in the automotive, aircraft and refrigeration fields, Houdaille produces force-feed lubricators, chemical feeders, tools, defense weapons, crushed stone and other construction materials.

Cory Expands in Canada

Cory Corp. (Canada) Ltd. added more than 10,000 sq ft to its manufacturing facilities in Toronto, Ont. The plant makes housewares and appliances. Cory's dominion was realigned into three major divisions: Western Sales Division, supervised by J. Barry Couch; Eastern Sales Division, supervised by D. R. Steel, Montreal, Que.; Central Sales Division, supervised by G. C. Grogan, Toronto.

Ryerson Buys Plant in East

Joseph T. Ryerson & Son Inc., steel warehousing subsidiary of Inland Steel Co., Chicago, announces the second expansion step this year in its New England operations. The company purchased the property and inventory of the Wallingford, Conn., plant of Folsbee Metals Corp., bringing to the locations through which it conducts its steel distribution business.

(Please turn to page 92)

HOLCROFT and the ROTARY FURNACE



high production in small space

Production rates frequently bog down when floor space limitations prohibit large equipment purchases.

That's why—when the problem is heat treating—many companies turn to Holcroft for answers. Experience—imaginative engineering—versatility of products—all team up to provide answers.

For example, the solution to the problem above could conceivably be a rotary furnace; with one or two doors for loading and unloading and a rotating hearth which carries the stock through the heat treat cycle. The hearth can be of a heat-resistant alloy or a refractory material—can be suspended from above or supported from below. Rotary furnaces can be tunnel-type, grid-type, drum-type, or rotating retort.

Of course, this is only one of the many kinds of stock handling which might be suggested by Holcroft. Your problem probably will be different and Holcroft will have the answer.

Write today for a copy of Holcroft's illustrated book:

"Blazing the Heat Treat Trail." It's bound to give you food for thought.

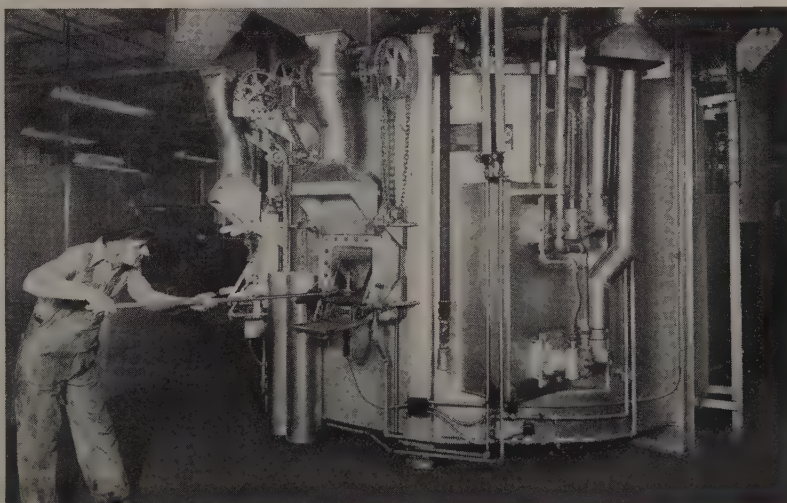
4875

HOLCROFT AND COMPANY



6545 EPWORTH BOULEVARD • DETROIT 10, MICHIGAN
PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CHICAGO, ILL. • CLEVELAND, OHIO • DARIEN, CONN. • HOUSTON, TEXAS • LOS ANGELES, CALIF. • PHILADELPHIA, PA.
CANADA: Walker Metal Products, Ltd., Windsor, Ontario



The Continuing Census of Metalworking

MAINTAINED SINCE 1939 BY THE PENTON PUBLISHING CO., PENTON BUILDING, CLEVELAND 13, OHIO

What products are made at this address?
 MAJOR PRODUCT
 OTHER PRODUCT

Which of the following activities apply to this address?

- ☒ Manufacturing
- ☒ Designing
- ☒ Sales
- ☒ General Office
- ☒ Reconditioning or Repairing
- ☒ Research
- ☐ Other (Please describe)

What is the value of the product made at this address?

- ☐ Under \$100
- ☐ \$100 - \$249
- ☐ \$250 - \$499
- ☐ \$500 - \$999
- ☐ \$1,000 - \$2,499
- ☐ \$2,500 - \$4,999
- ☐ \$5,000 - \$9,999
- ☐ \$10,000 - \$24,999
- ☐ \$25,000 - \$49,999
- ☐ \$50,000 - \$99,999
- ☐ \$100,000 and over

3521
 3521
 3521

If designing is done there, how many individuals with special training are employed there?
 machines, appliances or mechanical equipment?
 If designing is done elsewhere, please give address:
 What other manufacturing plants are operated as part of this company or its division?
 name, street address, city and state

Which of these operations are performed at this address?

- ☒ Machining
- ☒ Foundry (Except Die Casting & Ingots)
- ☒ Die Casting (Pressure)
- ☒ Forging
- ☒ Heat Treating or Annealing
- ☒ Stamping, Blanking or Drawing
- ☒ Other Sheet Metal Work
- ☒ Plate or Structural Fabrication
- ☒ Welding (Arc or Gas)
- ☒ Welding (Resistance, Spot or Flash)
- ☒ Packing
- ☒ Metal Washing or Degreasing
- ☒ Sand or Shot Blasting
- ☒ Electroplating
- ☒ Galvanizing or Tinning
- ☒ Buffing or Polishing
- ☒ Porcelain Enameling
- ☒ Lacquering, Enameling, etc., on product
- ☒ Assembly of Product
- ☒ Smelting and Refining
- ☒ Rolling

Please PRINT OR TYPE names of the following individuals if they are located at this address:

- PRESIDENT
- VICE PRESIDENT
- GENERAL MANAGER
- PURCHASING AGENT
- PLANT MANAGER
- FOUNDRY SUPERINTENDENT
- CHIEF ENGINEER
- CHIEF DESIGN ENGINEER

1570 Other and miscellaneous
 52
 3521 Tractors
 1522 Agriculture
 353
 3531 Constr to
 3537 Oil &c

Let's start with the PENTON market questionnaire.

It's been standard practice with us to conduct Continuing Census for use in our publishing operations. (Incidentally, we were the first industrial publisher to start this over 15 years ago.)

We notice how a company reports to us on the major products manufactured, as well as any other products made at this location.

We then translate this into S.I.C. code numbers for proper classification on IBM cards. The S.I.C. or Standard Industrial Classification* system was developed by the U. S. Bureau of the Budget. It is, by far, the most acceptable method in use today for classifying manufacturing plants by product categories and represents a major forward movement in marketing to industry.

PENTON looks upon unit coverage as the first essential in measuring how effectively a publication reaches its market. We use S.I.C. not merely as a filing system, but as the basis for effectively *matching* publication coverage to the number of worthwhile establishments in the market.

You benefit in many ways from our use of S.I.C. When you use a PENTON publication you know that you're covering the highest possible proportion of the worthwhile units in the market. You can see this in our modern method of reporting circulation breakdowns by S.I.C. classifications. It tells you how many plants are reached and how many copies go into these plants.

Using this information to buy space helps you add to the *effectiveness* of good advertising.

All manufacturers use this system in reporting to the U. S. Bureau of the Census.

*how PENTON's use
of S.I.C. adds to the
effectiveness of
your advertising*



the P E N T O N

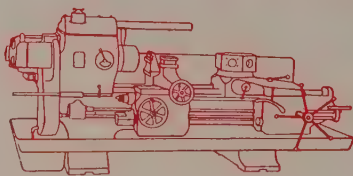
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Investigate the important production, maintenance and tax savings of SIMMONS ENGINEERED REBUILDING for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

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*Write for Simmons Way...
case histories of rebuilding jobs.*

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We carry your inventory.
Large stock for your convenience.
Special tools to order.
Quality and workmanship guaranteed.
Prices on Application.
Write Dept. A for New Catalog 54

GEO. F. MARCHANT COMPANY
1420-34 So. ROCKWELL STREET • CHICAGO 8, ILLINOIS

(Concluded from page 89)

ness. Ryerson expanded its Boston operations last March through acquisition of the Arthur C. Hovey Co.

Crown Cork Plant Diversifies

Crown Cork & Seal Co.'s Western Division is diversifying its San Francisco plant to include the production of beer cans. A high speed production line is being installed and is expected to start operations in May, 1956.

Structural Steel Firm Expands

Allied Structural Steel Companies, Chicago, acquired Glazer Steel Corp.'s Knoxville, Tenn. structural fabricating facilities. The plant will continue under the management of Byron McKenney. Glazer Steel Corp. plans to expand its warehousing operations in New Orleans.

Chiksan To Build in Houston

Well Equipment Mfg. Corp., operating division of Chiksan Co., Brea, Calif., will build a second plant in Houston for the manufacture of swivel joints and flexible line assemblies. Weco's present Houston plant makes a line of well unions, snatch blocks and other specialty items for the petroleum industry.



The Detroit sales office of Housen Tool Works, manufacturer of machines and cutting tools, and its Shakeproof Division, producer of fastening devices, moved to 1403 E. State Fair.

San Francisco offices of U.S. Steel Corp.'s Columbia - General Steel Division, Consolidated Western Steel Division and American Bridge Division moved to Equitable Life Bldg., 120 Montgomery St.

Oster Mfg. Co., manufacturer of pipe and bolt threading machines and materials handling equipment, completed its move to a plant at E. 289th street, Wickliffe, O.



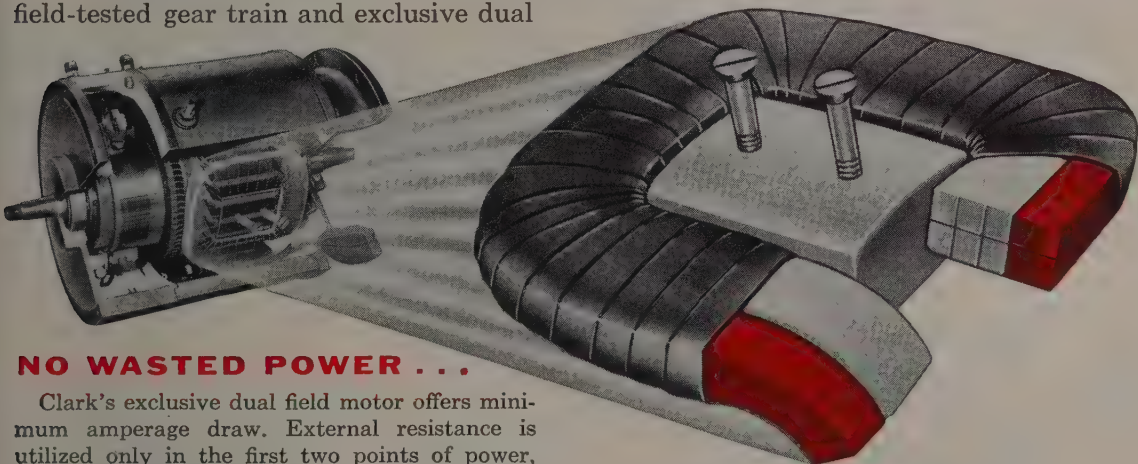
Efficient, fume-free Clark Electric stacks crated stoves 3 high at White Auto Sales, Wichita Falls, Texas.

CLARK ELECTRICS

work a longer cycle . . . do more work!

There just isn't any other power type that can move material at a lower cost per ton-mile than a Clark Electric. Clark's field-tested gear train and exclusive dual

field, high torque motor provide maximum efficiency under the most severe operating conditions.



NO WASTED POWER . . .

Clark's exclusive dual field motor offers minimum amperage draw. External resistance is utilized only in the first two points of power, thereby eliminating wasteful power losses and overheating. Result! Your battery works a longer cycle . . . your equipment does more work.

At 4th point of power Clark's exclusive *dual field* construction is achieved by eliminating half the field resistance (indicated in red).

Write for the booklet "Electri-Facts" showing cutaways of the power train, control circuit, hydraulic system, and other important components.

Industrial Truck Division
**CLARK EQUIPMENT
COMPANY**
Battle Creek 26, Michigan



ULBRICH Stainless Steels

Certified

ANALYSIS
can be given
on any Ulbrich
material.



COMPLETELY EQUIPPED CONVERTING WAREHOUSE

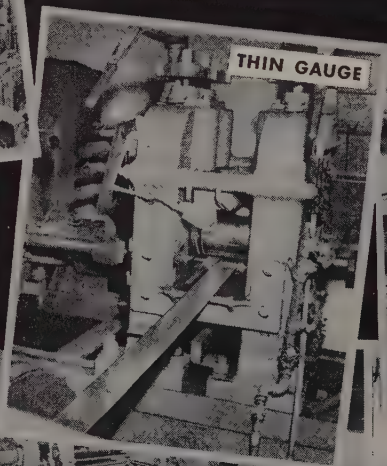
STRIP • Flat Wire and other Stainless Steels

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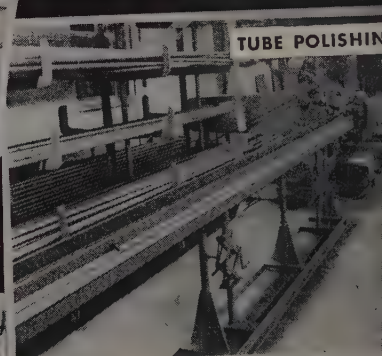
Inquiries for small lots welcomed.



INVENTORY



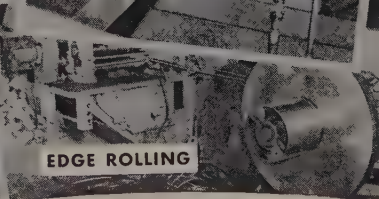
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ULBRICH Stainless Steels

WALLINGFORD, CONN.

Phone: COlony 9-7771

Technical Outlook

PORTABLE ROBOT— Unveiled two weeks ago at Ford's Cleveland Stamping plant: An automatic loader and unloader that can be moved from one press to another. It can be set up for a variety of parts. Plug-in connections provide power and quick adaptability to cams and limit switches on the presses. Ford's automation department designed it.

MINIMUM DOWN TIME— Emphasis is on cutting iron-to-iron down time to the bone in the new blast furnace Koppers is building for Granite City Steel. The stack will be built in an area adjacent to the old one. When it is finished, it will be rolled into position just as soon as the old stack has been torn down. With some modifications, the foundations of the old furnace will be used. The new furnace will take seven months to build. Shutdown time will be about 120 days.

BOUNCING BARRELS— Rubber containers, small as a carboy or big as a haystack, are made by U. S. Rubber Co. They are for shipping and storing liquids and granular or powdery materials. When empty, the big ones will collapse like balloons.

BOTTOM TENDER— Big ship bottoms get sacrificial anode protection. Now motor launches can have it, too. A streamlined magnesium anode has been designed for bolting to the hull.

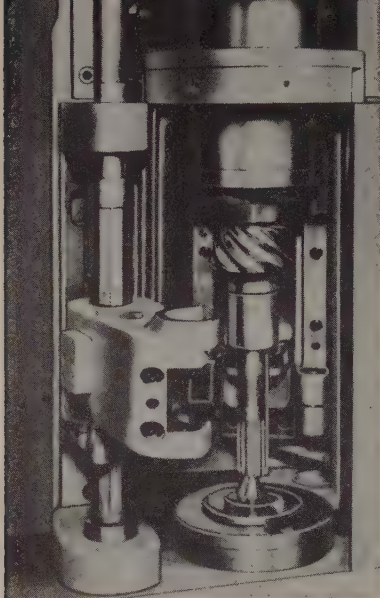
TINLESS CAN— A new food can developed by American Can Co. has an aluminum instead of a tin coating. Sideseams are welded instead of soldered — making it entirely tinless. Dr.

Randall Royce, manager of Canco's Atlantic division research laboratories, told the Pennsylvania Canners Association: "The aluminum coating on both bodies and ends gives better protection than tin on the outside of cans. The inside of the can is lined with an enamel coating." Welded sideseams make the can stronger than regular soldered types. In tests, the can's steel walls break before seams separate.

GOOD INVESTMENT— What tolerances can you get with investment castings? Aluminum can be cast as thin as 1/32-in., steel as thin as 3/64-in., with 120 (steel) to 60 (aluminum) microinch finishes. Tolerances can be held to ± 0.005 -in. per linear inch. Small parts, 1/4-in. or less, can be held to ± 0.003 -in. and bulky sections to ± 0.155 -in.

HELIUM SUBSTITUTE— Linde has developed a new shielding gas mixture to replace helium in high-speed, high-voltage applications of electric welding on stainless steels and other metals. Called "H-15 Argon mixture," it's said to be cheaper than helium because of lower flow rates needed for adequate shielding.

ALUMINUM BATTERY— A number of applications are being explored for aluminum dry cells now under final development, says Alcoa. The can for the battery follows the alclad principle — it's made of two alloys bonded together. Composition is such that the inner part has a solution potential higher than the outer part, so it's consumed preferentially during discharge or storage. The outer part is an inert barrier to prevent pinhole attack. The aluminum cell (1.6 to 1.7 volts) uses the same cathode as a zinc one — a mixture of manganese dioxide and acetylene black.



This quenching machine prevents distortion. The rear axle drive pinion shown is held securely and quenched in the same operation



UNETCHED X-10



ETCHED

A rough surface finish increases gear noise and wear. The photomicrographs show a rough finish (left) and a smooth finish (right). Adding sulphur to composition of steel improves machinability, sometimes surface finish, Sulphur should not be used where impact and clashing resistance are required.

The Over-All Look in Gear

A GEAR DESIGNER faces more problems than tooth size and proper metal. After deciding upon such engineering preliminaries, he

must consider a host of processing requirements before he can finalize his design.

Cost accountants badger him to

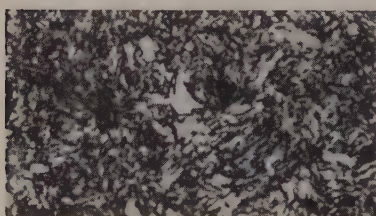
produce a cheaper design. Production management wants him to relieve a bottleneck. Shortages shut off his source of metal.

Tough competitors often demand a change in design. Big industry is staffed by men whose only job is to examine competitive products.

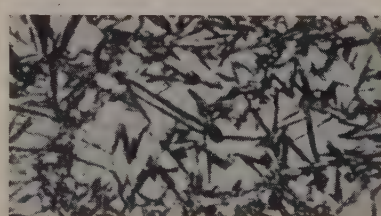
Quality—Plant management emphasizes quality control. The designer must consider what tolerances can be held economically with commercially available equipment.

Gear noise will plague everyone, including the designer, even when the car is on the road. Some manufacturers use electronic devices to measure noise levels. In spite of such refinements, gear noise is still measured by human sounds in the car.

How much it will cost to maintain the quality level you establish can only be measured by adequate experience. Final production must provide the necessary information.



NITAL X-750



NITAL X-750

More Case-Depth Vs. More Ammonia

Buick at first used continuous gas carburizing furnaces to treat conventional transmission gears. Designers later decided to add 0.5 per cent ammonia but came up with erratic case hardening that could show up in gear tooth pitting. The photomicrograph on the left shows the results of this treatment. Two solutions were possible: Increase the case depth by buying more equipment, or increase the nitrogen effect. The solution was to leave the case depth unchanged at 0.005 to 0.010 in. and increase the ammonia in the furnace atmosphere to 1.5 per cent. The harder case is shown in the microstructure on the right.

The drawing board
is only the beginning
in the auto industry.
Its experience with
diversified problems
can help you put
the broader look into

our engineering program

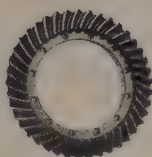
Design

Material—The best steel will be the cheapest one that will do the job. Which is cheapest? You must consider availability, machinability, initial cost, heat treating cost, uniformity of heats and performance. Obviously, a good steel that is easily machined but hard to buy is not the right one. Nor is the steel right if processing is too complicated. The preferred steel will be the one that requires few steps to make it suitable.

Steels vary between heats. You have to be certain that the supplier's specifications are well within the limits of your own requirements. Borderline cases have a tendency to show up in the complaint statistics. Buick, for example, runs pilot lots for new heats to determine distortion characteristics.

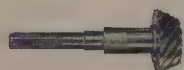
Processing—The larger manufacturers maintain process engineering departments that specify the way the gear will be made. A new

The Over-All Look in Gear Design



Ring Gear

Manufacturer	S.A.E. Steel	Carburizing Method	Case Depth (Inches)	Quench Medium		Tempering Temp (F)
				Type	Temp (F)	
A	8615	Pack	0.040-0.055	Oil	130-140	325
B	4620	Gas	0.045-0.055	Oil	115	375
C	8617H	Gas	0.040-0.045	Oil	115	325
D	8620	Gas	0.040-0.050	Oil	130	None
E	8620	Gas	0.040-0.050	Oil	110	425
F	1024	Gas	0.030-0.040	Oil	130-140	350
G	4028	Gas	0.040-0.050	Oil	130-140	360
H	4028	Gas	0.040-0.050	Oil	100-120	350-375
I	4118	Gas	0.040-0.050	Oil	130-150	350



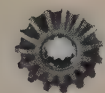
Drive Pinion Gear

Manufacturer	S.A.E. Steel	Carburizing Method	Case Depth (Inches)	Quench Medium		Tempering Temp (F)
				Type	Temp (F)	
A	8617	Gas	0.045-0.060	Oil	130-140	325
B	4620	Gas	0.045-0.055	Oil	115	400
C	8617H	Gas	0.040-0.045	Oil	115	None
D	8620	Gas	0.040-0.050	Oil	130	None
E	8620	Gas	0.040-0.050	Oil	110	300
F	1024	Gas	0.030-0.040	Oil	130-140	350
G	4028	Gas	0.045-0.055	Oil	130-140	360
H	4028	Gas	0.040-0.050	Oil	100-120	350-375
I	8620	Gas	0.040-0.050	Oil	100-120	350-375
I	4118 Mod	Gas	0.040-0.050	Oil	130-150	350



Side Pinion

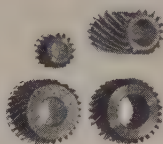
Manufacturer	S.A.E. Steel	Carburizing Method	Case Depth (Inches)	Quench Medium		Tempering Temp (F)
				Type	Temp (F)	
A	5130	Gas	0.005-0.015	Oil	130-140	350
B	1022	Pack	0.045-0.055	Caustic	85	350
C	8617H	Gas	0.040-0.045	Oil	115	None
D	8615	Gas	0.040-0.050	Oil	130	None
E	1024	Gas	0.040-0.050	Oil	110	300
F	1024	Gas	0.020-0.030	Oil	130-140	350
G	8620H	Gas	0.030-0.040	Oil	130-140	360
H	4024	Gas	0.030-0.040	Oil	100-120	350-375
I	1016	Gas	0.040-0.050	Water	.....	None



Side Gear

Manufacturer	S.A.E. Steel	Carburizing Method	Case Depth (Inches)	Quench Medium		Tempering Temp (F)
				Type	Temp (F)	
A	5130	Gas	0.005-0.015	Oil	130-140	350
B	1024	Gas	0.045-0.055	Oil	115	350
C	8617H	Gas	0.040-0.045	Oil	115	None
D	8615	Gas	0.040-0.050	Oil	130	None
E	1024	Gas	0.040-0.050	Oil	110	300
F	1024	Gas	0.020-0.030	Oil	130-140	350
G	8620H	Gas	0.030-0.040	Oil	130-140	360
H	4027	Gas	0.030-0.040	Oil	100-120	350-375
I	1132	Gas	0.015-0.025	Oil	130-150	400

The Over-All Look in Gear Design



Auto Transmission Pinions

Manu- fac- turer	S.A.E. Steel	Carburizing Method	Case Depth (Inches)	Quench Medium		Tempering
				Type	Temp (F)	Temp (F)
A	5145	Gas	0.007-0.010	Oil	125-130	440
F	1024*	Gas	0.020-0.030	Oil	130-140	350
H	4028	Gas	0.030-0.040	Oil	170-180	400
I	1330H	Gas	0.007-0.012	Oil	325	400
J	5140H	Gas	0.005-0.010	Oil	300	375-510
J	5145H	Gas	0.005-0.010	Oil	300	510



Manual Transmission

Manu- fac- turer	S.A.E. Steel	Carburizing Method	Case Depth (Inches)	Quench Medium		Tempering
				Type	Temp (F)	Temp (F)
A	8620	Gas	0.035-0.050	Oil	120-130	300-350
B	5117	Gas	0.040-0.050	Oil	110-130	300
B	1340H	Gas	0.005-0.010	Oil	130-150	400
C	8640H	Gas	0.008-0.015	Oil	115	425
D	8620H	Gas	0.040-0.050	Oil	180 or Salt 400	375
F	1024	Gas	0.030-0.040	Oil	130-140	350
			0.020-0.030	Oil	130-140	350
G	5135H	Gas	0.012-0.016	Oil	130-140	360
H	4027	Gas	0.030-0.040	Oil	145-175	400-410
I	1340H	Gas	0.005-0.010	Oil	130-150	400



Flywheel

Manu- fac- turer	S.A.E. Steel	Carburizing Method	Quench Medium		Tempering
			Type	Temp (F)	Temp (F)
A	1050 Mod.**	Furnace	Oil	130-140	750
C	1045	Flame	Oil	115	500-600
F	1050	Flame	Oil	130-150	500
G	1946	Induction	Water†		700††
H	1045	Flame	Oil	100-120	500-600††
I	1045	Flame	Oil	130-150	500-550††
J	1045	Flame	Oil	130-150	550

*1200° F after rough machining

**Carbon 0.48-0.53; Manganese 0.85-1.05 coarse ground

†Removed at 550° F

††Induction

This chart compares the gear steel selection and treatment of several automobile manufacturers. It is adapted from information compiled by V. E. Hense, chief metallurgical engineer, Buick Division, for GM's Engineering Journal (Sept.-Oct. '55).

material calls for co-ordinated effort to cut later design changes.

Machining costs will be closely to surface finish and life. The proficient designer gets as much production data as he can to estimate final production cost.

Testing—No design is final until the gear has been tried out in service. Lab tests are necessary, useful, but the acid test is service. Wear, shock resistance and quietness of operation are the important points to consider.

From the designer's viewpoint, however, most unsatisfactory gear designs are rejected for heat treating and processing deficiencies.

Heat Treatment — The designer may choose one or a combination of annealing, cycle annealing, normalizing or case hardening. If the gear is forged, annealing may be necessary to permit easier machining and reduce distortion from further heat treatment.

Die quenching reduces dimensional variations from heat treatments.

A hard surface is usually desirable. Through hardening, carburizing, flame hardening, induction hardening, gas carburizing, cyaniding—each type has physical effects that require individual knowledge and study.

The selection of a heat treatment process, either annealing or hardening, is based on cost and the overall effect it has on subsequent operations.

Physical Requirements — The size, the number of teeth, the dimensions, etc., are determined by the job the gear needs to do. The designer must know the stresses involved, the kind of service expected, the conditions under which the gear will operate.

Perhaps housing limitations are a factor. The gearbox may have to be as small as possible without sacrificing efficiency.

Automotive Practices — In spite of intense study, automotive designers differ widely as to which steel and process is best for a particular application. A 1955 survey of steels used in rear axles, transmissions and flywheel ring gears shows wide variation in practice.

• Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13,

THE RIGHT COMBINATION

Abrasive——Silicon carbide
Belt backing——Paper for some flat sheet work; cloth for more rugged grinding

Abrasive grit——40 to 80 for roughing and spotting; 120 and finer for high finishes

Belt support——Hard rubber, plastic or metal contact wheels

Belt speed——1500 to 2500 sfpm when using grinding fluid; 1000 to 1500 sfpm for dry grinding

Grinding fluid——Heavily sulphurized and chlorinated cutting oils for nonwaterproof belts; a 5 per cent solution of sodium nitrate in water for waterproof belts

Grinding Titanium with Abrasive Belts

By DR. HUGH N. DYER

Director of Product Testing
Behr-Manning Division
Norton Co.
Troy, N. Y.

COSTS six to ten times more to remove a cubic inch of titanium with abrasive belt grinding than it does to do the same amount of work with stainless.

As improvements in tools and grinding fluids come, this cost can be expected to go down. But even without present high costs, abrasive belt grinding of titanium and its alloys gives excellent results at costs competitive with other methods of stock removal.

Problem Metal — Chemical and physical properties make titanium difficult to grind with coated abrasives. The metal is so reactive at the temperatures generated in grinding that abrasive grains rapidly dull or flatten. Grains sliding over the surface create additional heat but do little useful cutting. Successful grinding with abrasive belts depends upon reducing grain wear by lowering the temperature at the grinding point and using grinding fluids which form protective films over the freshly cut metal surfaces.

The Right Belts—Silicon carbide coated abrasives give the best results. Paper-backed belts, used dry or with an oil or grease, are suitable for some flat sheet work. Where more rugged backing is needed, cloth-backed belts are

used. Synthetic resin bonds provide maximum durability.

When water-base grinding fluids are used, waterproof cloth-backed products are necessary. Grits 40 to 80 are best for roughing and spotting, grits 120 and finer for high finishes.

Belt Support—The contact roll supporting the belt should be as small in diameter and as hard as practicable. This provides almost line contact and high unit pressure between abrasive and work. Heat build-up, dulling and glazing are reduced; fracture wear, which exposes fresh cutting edges, is promoted.

Flat shoes or platens and soft rolls usually lead to rapid belt failure from dulling. An exception is the use of a softer rubber roll for blending and spotting, as in the removal of small defects in sheet or coil, either before or after final reduction.

Belt Speed—A low belt speed reduces the temperature at the grinding point. When a grinding fluid is used, speeds between 1500 and 2500 sfpm are recommended. For dry grinding, speeds between 1000 and 1500 sfpm give good results. Low belt speed also reduces the tendency for the work surface to be scorched or marred by ac-

cumulations of incandescent chips.

In addition to cooling and quenching the spark, grinding fluids reduce the reaction between metal and abrasive grain. A grinding fluid always should be used when taking continuous cuts over fairly large areas. For interrupted cuts, such as spotting defects in sheets or bars or offhand grinding of small parts, dry grinding at low speeds gives good results.

Grinding Fluids — Heavily sulphurized and chlorinated cutting oils are good grinding fluids, and can be used with nonwaterproof, coated abrasive belts. Because of the extremely hot spark, only oils of the highest flash point (above 325°F) should be used. The fluid should be applied close to the grinding point.

Water-base grinding fluids present no fire hazard and are relatively inexpensive, but they require the use of waterproof belts. Conventional soluble oils in water are poor grinding fluids for titanium, but may be useful where the alternative is grinding dry at speeds over 1500 sfpm. Rust inhibitors of the nitrite-amine type give good results when used with water. The most effective water-base fluid found so far is a 5 per cent solution of sodium nitrite.

Welded aluminum chain
fills in a high-strength,
low-weight gap.
It's a new material
with big potential
in architectural, marine,
chemical processing and
food handling applications

By H. F. REID Jr.
Manager, Technical Services Div.
McKay Co., Pittsburgh



A Missing Link for Chain

NO OTHER PRODUCT quite takes the place of chain. But it is heavy; for a long time we've needed a strong, lightweight, noncorroding addition to the family. It has taken until now to develop a marketable welded aluminum chain.

The McKay Co. set up a program to adapt conventional chain-making equipment and procedures to the production of welded aluminum chain. It has succeeded in developing a commercial product, made by resistance welding equipment of its own design.

Specifications—The chain is being made in four sizes: 1/4, 5/16, 3/8 and 1/2-in. These nominal dimensions are 1/32-in. under material diameter (see table). The working load limit is about 60 per cent of the same diameter carbon steel chain.

The light weight of the aluminum chain (less than 40 per cent of steel) gives it a strength-for-weight advantage. This and its other properties—pleasing natural finish, corrosion resistance, non-sparking and nonmagnetic characteristics, ability to take colored

anodized finishes—open up new fields for industrial, architectural and marine uses.

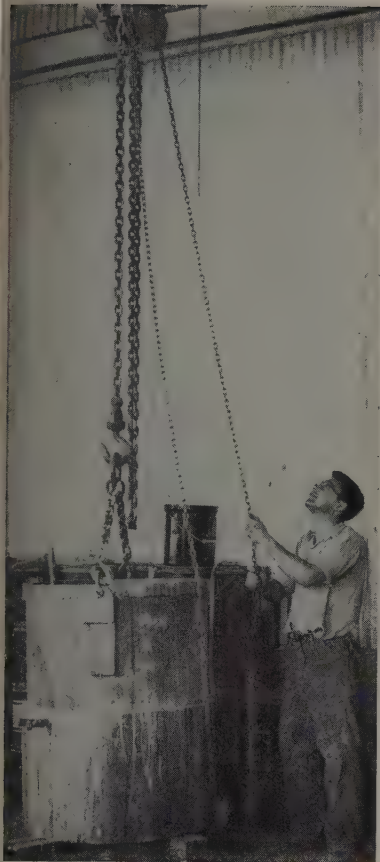
Many Uses—The product should be advantageous in chemical manufacturing, where corrosive atmospheres or explosive products demand special chain; food processing plants, where sanitation is uppermost; and other fields, such as textiles. Architectural use offers tremendous potential. The chain can be left exposed to the elements without becoming unsightly.

It is a natural in the marine field, being unaffected by fresh or salt water. Several thousand feet are in marine service.

The welded chain is being produced initially from only one alloy, 52S, and is being marketed in the as-welded condition. Further research and development work is needed before higher strength chain in some of the heat-treatable alloys is available. Look for it in about six months.

Specifications for Welded Aluminum Chain

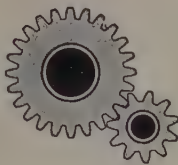
Chain size, in.	Material diameter, in.	Inside link size width in.	Inside link size length in.	Working load limit, lb	Weight per 100 ft, lb
1/4	3/8	1/2	1	550	24
5/16	3/4	3/4	1 1/4	850	36
3/8	1 1/8	1 1/4	1 3/4	1200	54
1/2	1 3/4	1 3/4	2 1/2	2000	91



Sparkproof welded aluminum chain handling volatile solvents in a plastics plant

Opportunities Look Up for Welded Aluminum Chain

- Chemical processing equipment
- Oil field equipment
- Explosive manufacturing and handling
- Fishing boat rigging
- Anchor chain for small craft
- Babbitt wheel chain
- Guard chain
- Decorative chain
- Food processing equipment
- Materials handling to 2,000 lb
- Lightweight sling chain assemblies
- End gate chain
- Swing chain
- Well chain
- Buoy mooring chain
- Steering gear and tiller chain
- Handrail and safety chain
- Animal leads and halters
- Passing link chain
- Pocket wheel chain
- Spinning chain



MACHINE TOPICS

By R. F. HUBER, Machine Tool Editor

Step by Step

DO-IT-YOURSELF automation can be a bear trap. One Detroit builder of automation equipment gives this advice to anyone who is interested in adding automation to his plant: Engineer the process one step at a time, beginning at the beginning. It sounds fundamental, but he guesses fully half the automated headaches come from failure to follow the rule.

He puts it this way: If you have a grinding operation to remove 0.002-in. of stock, it won't work right unless the machines before it leave only 0.002-in. on the part. Or, as one auto builder found out, if you want to automatically assemble type X fasteners, you need to be sure that type X is furnished to the assembly station with no chance for others to get in.

The easiest automation job, the builder says, is on a line where equipment is already performing within required tolerances and at the right production rate. Addition of automatic handling, cycling and checking systems is a natural.

But when you start to build a new line to do a new job, every operation must be completed within tolerances at prescribed rates—otherwise, there's no sense in trying to get the succeeding steps to work.

Checker — He also feels there's too much automating of machine cycles without providing for adequate inspection. When you take the operator away, you also lose his eagle eye and quick adjustment. Automatic machines, he says, need some

gage that will check part quality, either adjust or stop the machine when parts aren't right.

Stockpile Switch

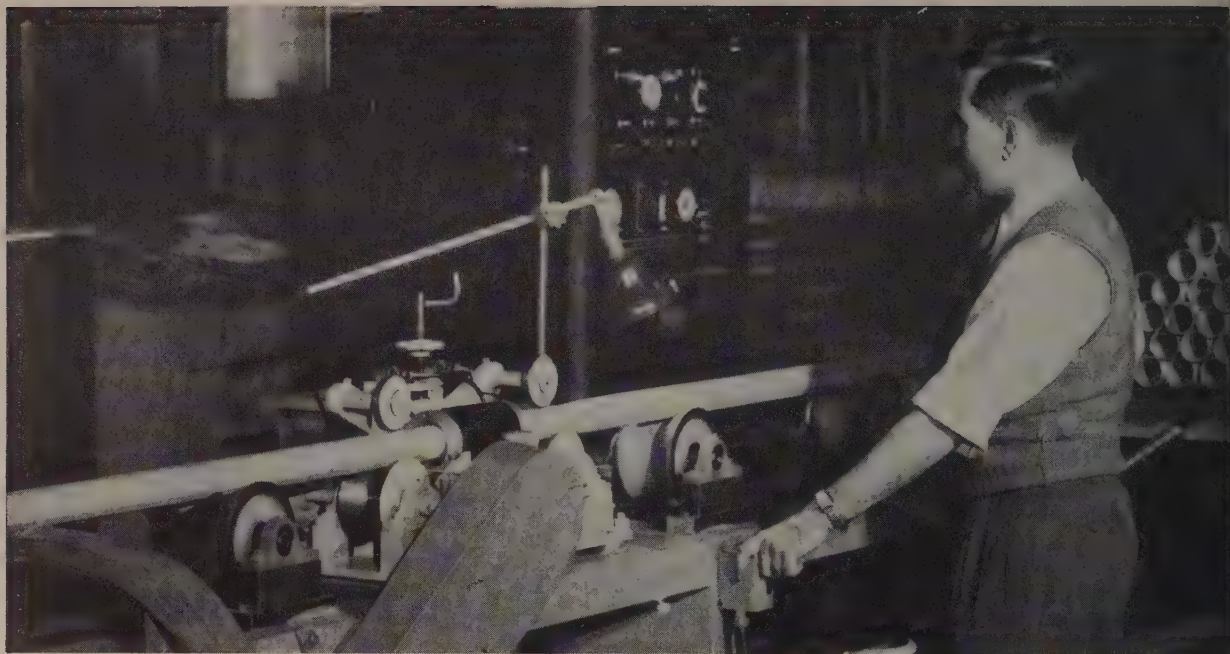
Defense officials are betting on a short war. They're more interested in reserve weapons than in reserve capacity to produce them.

The new Air Force machine tool program (STEEL, Dec. 5, p. 83) concentrates on active production programs.

Double Barreled — When the big reserve machine tool program was halted several weeks ago, it was for two primary reasons: Economy and obsolescence. The new program trims \$14 million from the AF budget. Officials concluded machines bought now would be obsolete when they're needed after they observed the fast clip of machine development and improvements.

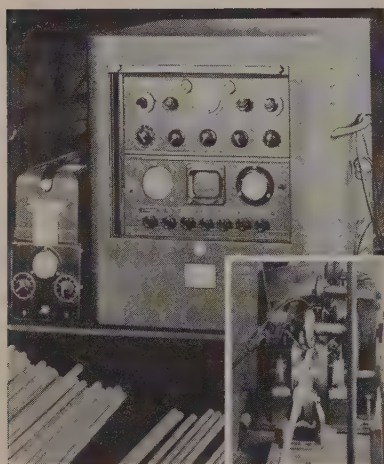
The new program satisfies them on the first count. It only partially solves the second. Machines bought and used now become just as obsolete as those bought and stored now. Continuous buying is the only answer.

Sales Job—There was no delay in putting the new plan into action. AF officials were ready to let a huge block of contracts when the other one was grounded. They quickly prepared a new tack and hustled to the Defense department. In a matter of days, the new plan got top approval. One AF representative figures almost all contracts will be let within a month.



Pressing the button gives tubing . . .

A Cheaper, Better, Faster Test



The brains and the workhead. Variations in magnetic density are interpreted by the analyzer. Colored lights, oscilloscopes, tape and buzzer tell when to reject

stainless steel. The maker says that any nonmagnetic metal can be tested.

Not only does the machine check surfaces (ID and OD) for holes, cracks, flaws or weld imperfections, it detects certain types of sub-surface defects. In addition, metals can be verified by type. For example, if type 316 stainless steel is being tested, type 304 will be rejected.

Production—Latest to adopt this method is Carpenter Steel's Alloy Tube Division in Union, N. J. Welded stainless steel tubing up to 4½-in. in diameter is tested automatically. Presently, the machine will operate at 400 fpm but a peak of 600 fpm is expected. Only one inspector is needed to operate the machine and observe results.

Although Carpenter Steel still pressure tests tubing 100 per cent, it expects that the newer, magnetic method eventually will be the only one used. Pressure (hydrostatic) testing is destructive and tests only failure. The magnetic method is more thorough and reveals quality imperfections like weepers that im-

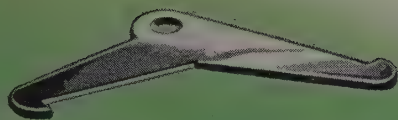
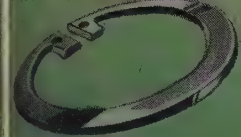
pede fluid flow, carburization on the ID, internal flaws that fail from fatigue, variations in wall thickness, inside and outside diameter and variations in chemistry.

Magnetic permeability must stay within 1 and 1.6-in. each 4-in. length. Greater variations will cause rejections for nonquality reasons.

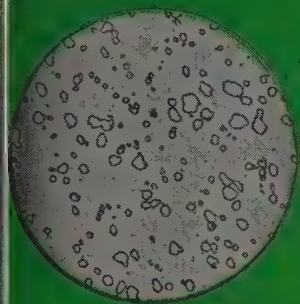
Costs—Magnetic testing is said to be three or four times faster than the hydraulic test. The equipment can be leased from the maker (Magnetic Analysis Corp., Long Island City, N. Y.).

Application—Almost every week new uses are being found. Revere Copper & Brass recently started checking copper and brass tubing with the magnetic tester. Another firm checks aluminum and Monel tubing. Still another is checking wire, some as fine as 0.003-in. There are even some high temperature steels and titanium alloys finding their way into the picture.

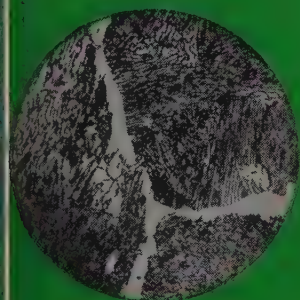
Several fabricators use the machine to test the quality of incoming stock. It serves as a double check for critical applications.



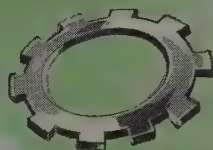
consistent uniformity!



SPHEROIDIZED . . .
for easier cold forming



PEARLITIC . . .
for easier blanking procedure



WEIRTON

high carbon strip cold-rolled spring steel

Manufacturers throughout the nation find Weirton cold-rolled spring steel consistently produces best results in a wide variety of products.

Weirton supplies spheroidized-annealed cold-rolled spring steel for operations where superior forming qualities are necessary. Simple and economical fabrication is assured by the exceptional ductility of the controlled grain structure.

Where clean, economical blanking is the major requirement, Weirton supplies pearlitic steel structure that is temper-rolled in controlled hardness and tensile strength.

Both structures are available for specific heat treating and hardness. And in both structures, Weirton high carbon cold-rolled spring steel possesses five highly important characteristics: 1. Uniform chemical and physical properties. 2. Exact consistency of grain structure. 3. Accurate response to heat treatment. 4. Exceptional uniformity of gauge and width. 5. Controlled decarburization limits. . . . Why not let Weirton help make your product better?

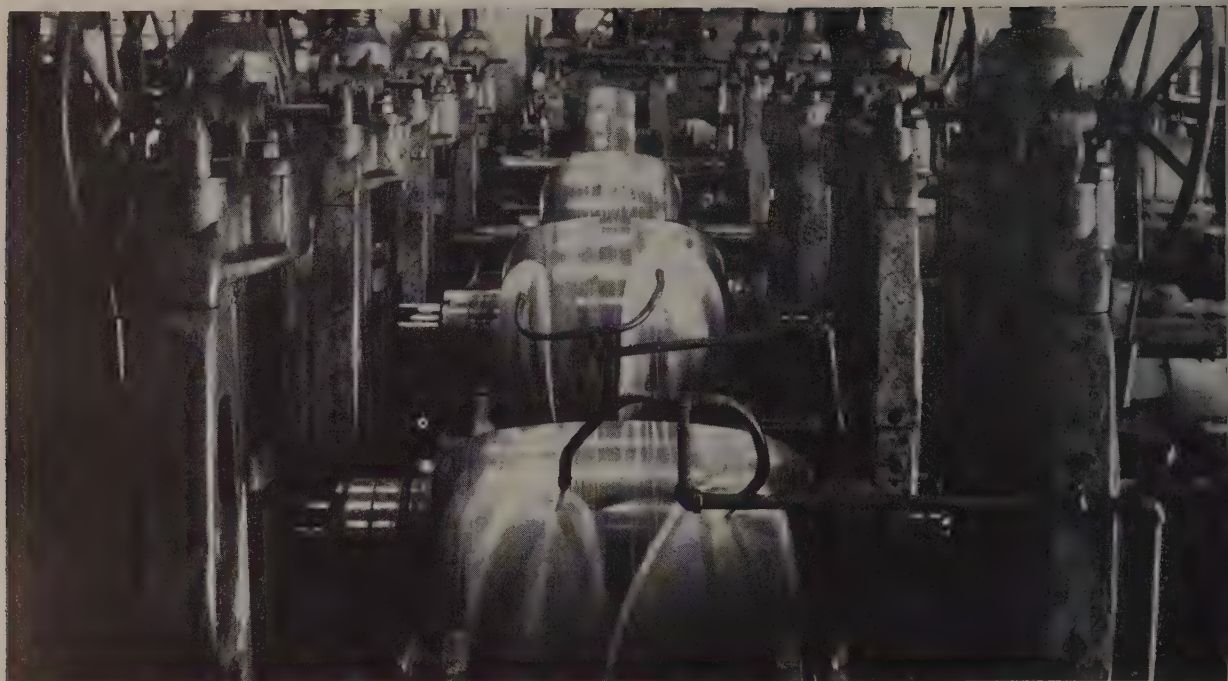


WEIRTON STEEL COMPANY

Weirton, West Virginia

NATIONAL STEEL CORPORATION





Lubricant used on this 10-stand forming mill is under a constant deluge of water

One Grease for Everything

With thousands of lube fittings in its two 2700-ft long pipe mills, Lone Star Steel Co. finds a multipurpose grease simplifies maintenance and extends bearing life

LUBE APPLICATIONS in a pipe mill are critical. Bearings and equipment are subjected to heat up to 250°F, pressures up to 20 tons, high speeds and water-based coolants.

At Lone Star Steel Co., Lone Star, Tex., pipemaking is highly mechanized. Two mills form coiled skelp into welded, normalized casing, tubing and pipe at the rate of 30 to 150 fpm—350,000 net tons a year.

Maintenance Problem — From start to finish, piping is handled on a system of runout tables, roller beds and chain transfers. The operation demands an efficient maintenance program, with particular emphasis on trouble-free lubrication.

For all but one extremely high-

temperature application, Lone Star uses a lithium-base, multipurpose grease which combines lithium with 12-hydroxy stearic acid (hydrogenated castor oil).

Critical Point — One of the toughest lubrication spots is the point where formed tube enters the 4000-kva Yoder electric resistance welder. The unit has four rolls, one on each side and one on top and bottom. The top roll is the electrode—twin copper discs, 57 in. in diameter. Electric current passes from one disc across the two skelp edges and out the other disc.

Transformer heat gets up to 200°F, squeeze rolls exert up to 20 tons of pressure and the entire unit is deluged with coolant. The formed metal is welded at speeds

up to 120 fpm. The grease used must have high mechanical stability.

Washed Out—Before standardizing on one grease, squeeze roll and transformer bearings had to be checked every three weeks—the grease practically washed out. This meant a shutdown of 16 to 24 hours for bearing inspection.

Using the lithium-base grease, Lone Star has extended its check period to three months. When bearings have to be inspected, a replacement transformer is put on the line, reducing shutdown time to a few hours.

No Failures—There have been no bearing failures since switching to the multipurpose grease. It stays in the bearing and retains high lubricating qualities, even in



7 of the 8 open hearths in No. 2 shop at Indiana Harbor have Ramset bottoms

YOUNGSTOWN Sheet and Tube is making steel on 7 Ramset bottoms in its No. 2 open hearth shop at the Indiana Harbor Works.

The majority of bottoms installed in new open hearth shops during the past several years are of rammed construction. And of these hearths, Ramset installations number more than half again as many as any other magnesia ramming mix.

Basic Refractories pioneered the development of rammed hearth techniques several

years before World War II. These methods have been continuously refined by the practical steelmakers who form the sales and service staff of Basic Refractories. As a result Ramset and Basic's installation techniques have become accepted as standard throughout the industry.

When deciding upon Ramset steelmakers select a proven refractory and proven installation methods, thus insuring the most dependable open hearth bottom construction available.



BASIC REFRACTORIES INCORPORATED 845 HANNA BUILDING, CLEVELAND 15, OHIO
REFRACTORIES ENGINEERING AND SUPPLIES, LTD. — EXCLUSIVE CANADIAN AGENTS

Advantages of One-Grease System

1. Cuts cost of handling different greases
2. Reduces bookkeeping and inventory
3. Gives the economic benefits of buying one grease in volume
4. Cuts time, expense and equipment involved in servicing thousands of lube connections
5. Eliminates misapplication of greases
6. Gives longer bearing life and extends relubrication period safely, to reduce grease consumption

the presence of water. To further extend check periods, Lone Star built a water seal for the transformer.

A ten-man crew makes daily rounds of the 4000 to 5000 grease fittings. With the exception of three systems (two Farval and one Lincoln), all connections are serviced with pressure guns. The men must maintain two 2700-ft long pipe mills, with a mass of automatic equipment. This would be impossible if a variety of greases and applicators were used.

Three Weights—To further simplify its procedures, Lone Star has established three grease designations—G-1, G-2 and G-3—the code numbers for different weights of Shell Oil Co.'s Alvania, the grease being used.

A step-by-step tour down the

production line demonstrates the practicality of the company's one-grease system.

Pipe Making — The No. 1 pipe mill makes 4½ to 16-in. pipe and casing, with wall thicknesses ranging from 3/16 to 9/16-in. Coiled skelp weighing up to 15 tons is fed to the forming and welding mill on Link-Belt gravity rollers. G-1 lubricates the thousands of bearing points on this conveyor.

Preparing the metal for welding, the skelp is uncoiled, leveled, ends cropped, edges trimmed and shot blasted. Then it is formed into a continuous open tube in a series of ten stands. Throughout these steps, G-1 is the only grease used. Automatic Lincoln lube systems (with a 10-lb reservoir and pressures up to 2500 psi) are in operation on the uncoiler and side

trimmer. There are no difficulties with pumpability.

Water Hazard—Pillow bearing on the approach conveyor to the stands are greased with G-1. Soluble oil-and-water spray on the formers creates a constant water hazard.

From the formers, the open tube and pipe enter the welder. G-1 is used on the squeeze rolls, G-2 on the transformer bearing. Three pull-out stands after the welder give an initial sizing to the pipe. It is cut to length by a flying cut-off machine which can sever pipe of ½-in. wall thickness in 4 seconds. All these machines are lubricated with G-1.

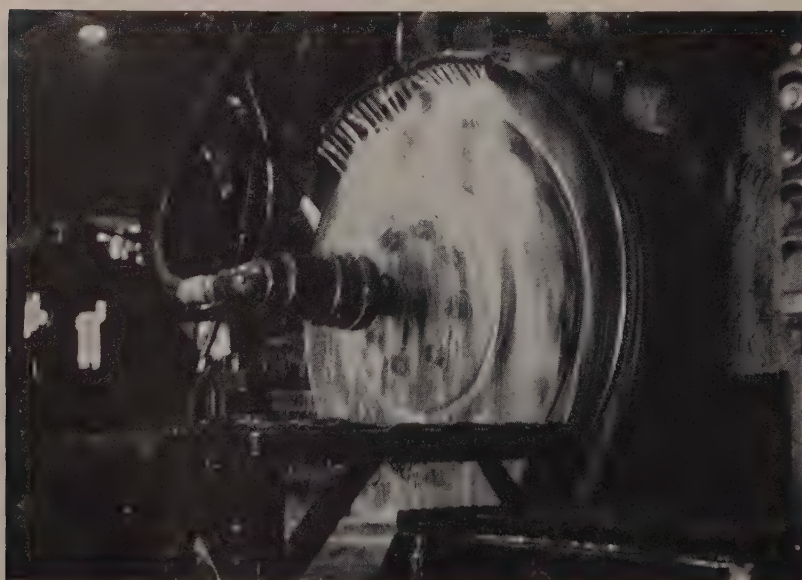
The cut lengths of pipe are given a second sizing and preliminary straightening on a 3-stand sizing mill which is greased with G-1.

Normalizing—From these mills the welded pipe and casing travel to the normalizing furnaces which stretch out for 240 ft and are capable of heating 90 tons of pipe to 1650°F in 1 hour. This is another critical grease application. Here the bearings on the lead tables and the cast iron self-aligning bearings on the furnace are lubricated every day with G-1. At the end of the furnace line, where incandescent pipe is delivered to the cooling tables, it is necessary to use lubricant resistant to extremely high temperatures.

Automatically operated cooling conveyors, the cold sizer, the rotary 7-roll straightener and the runout tables which handle the pipe after normalizing are G-1 lubricated.

Cutoff Tables—The pipe, now of proper dimensions, is put on inspection tables and then transferred to ten cut-off machines where a double-pump, 1000-psi Farval system provides G-1 lubricant to the machines and the cut-off tables which are 64 ft 6 in. long.

Threading, coupling and hydrostatic testing follow. With the exception of the coupling operation where a Farval system is used, all machinery is greased with pressure guns. After weighing, stenciling and coating, the pipe and casing are sent to the yard, ready for shipment.



Critical lube point is at this resistance welder. Grease here must withstand heat, pressure, coolant and high speed

PROOF:

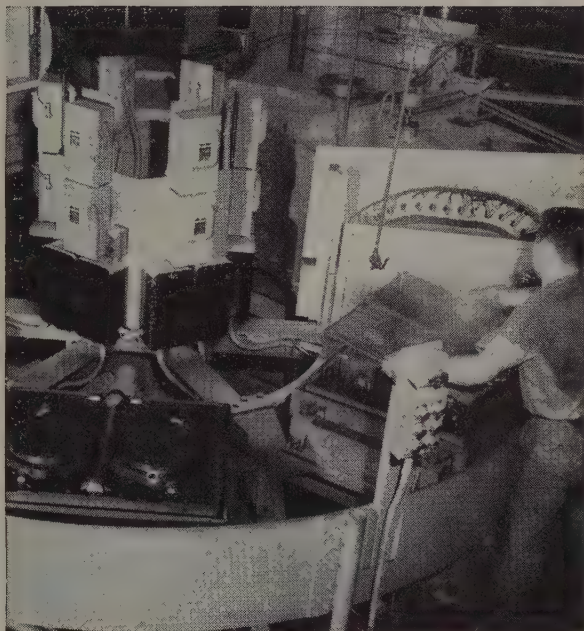
Chateaugay Pig Iron . . . ideal base metal for shell-molded, ductile iron castings

For years, the Lynchburg Foundry Company, Lynchburg, Virginia, has used Chateaugay—Republic's exclusive premium Pig Iron—for castings requiring outstanding high strength, uniformity and machinability. Further, Chateaugay gave them added benefits through its ability to fill adjacent light and heavy sections evenly, thus a fine and uniform grain structure . . . and an exceptionally good surface with high wear-resistance.

Now, with their new shell-molding foundry in production, Chateaugay Pig Iron has proved to be the ideal base metal for Lynchburg Foundry's ductile iron castings, produced by this modern method.

Basically, Chateaugay's very high carbon and unusually low sulphur, phosphorous and manganese content suit it perfectly for ductile iron use. Beyond this, however, its inherently excellent physical properties are maintained in the ductile form, so that LFC is assured of consistent top quality in every casting. Finally, Chateaugay's naturally good surface and uniform shrinkage characteristics enable LFC to maximize, in each casting, the superior surface finish and closer dimensional accuracy advantages of the shell-molding process.

For the complete story on Chateaugay, the low-phosphorous, copper-free pig iron, call in a Republic Pig Iron Metallurgist. There is no cost or obligation for his services. Simply contact your local Republic representative to let us know when you would like him to call.



NEW, AUTOMATIC SHELL-MAKING MACHINE is typical of the up-to-date methods employed in Lynchburg Foundry Company's shell-molding process. Consistent high-quality production of ductile iron castings is assured through the use of Chateaugay Pig Iron as the base metal.

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U-shaped blocks are inserted around guide pins



Removing block from storage position automatically cuts off power

Safety Blocks Muzzle the Press



With safety blocks in press opening, workman is fully protected

BLOCKING the press opening whenever an operator or repairman is working under the ram is solid safety practice. But, too often, anything handy, a piece of wood or a scrap of steel, is expected to

do the job. One company is making permanent safety blocks of lightweight magnesium.

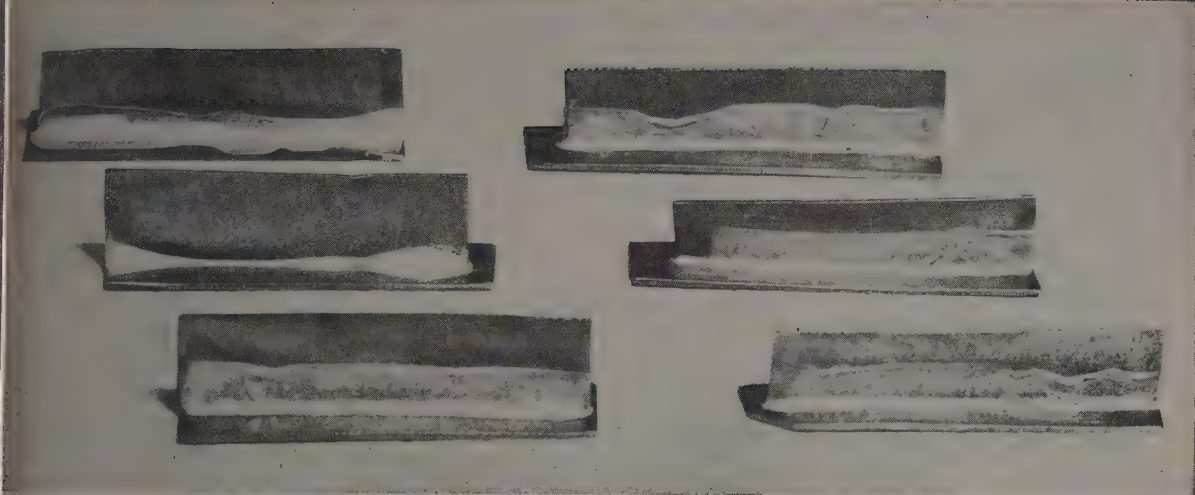
Power Cutoff—Attached to the block is an electrical plug. When the block is in its storage position

at the side of the press, the plug is inserted into an electrical receptacle which closes the power circuit to the machine.

When an operator removes the block to put it in the press, he has to pull the plug and all press power is cut off. This power disconnect system also makes sure the safety blocks are available all times.

Why Magnesium? — Blocks are made of magnesium because of the metal's light weight and high impact strength. It is easily extruded, which results in low-cost, special shapes. Most important, it has guaranteed minimum strength

Safety blocks come in a variety of sizes and shapes and can be used in hydraulic or mechanical presses. One or more blocks are used in each press, depending on the capacity and dimensions of the machine. They are made by Magnalloy Inc., Pinconning, Mich.



roduction brazing T-bars is a step toward better knowledge of . . .

How To Form Zirconium

THE NEW MEMBER of the royal family of corrosion resistant metals is strong as steel and nearly 50 per cent lighter.

The first cousin of titanium and hafnium, zirconium is finding a place in chemical equipment, plating plants, hydraulic systems, surgery and atomic energy, to name only a few. Any day you may get an inquiry about machining, forming or fabricating it.

When you do, here are some tips.

Forming—Take a look at STEEL's latest article on forming stainless steel and use the chart for equipment selection (Nov. 14, p. 114). The same equipment and methods can be used for zirconium.

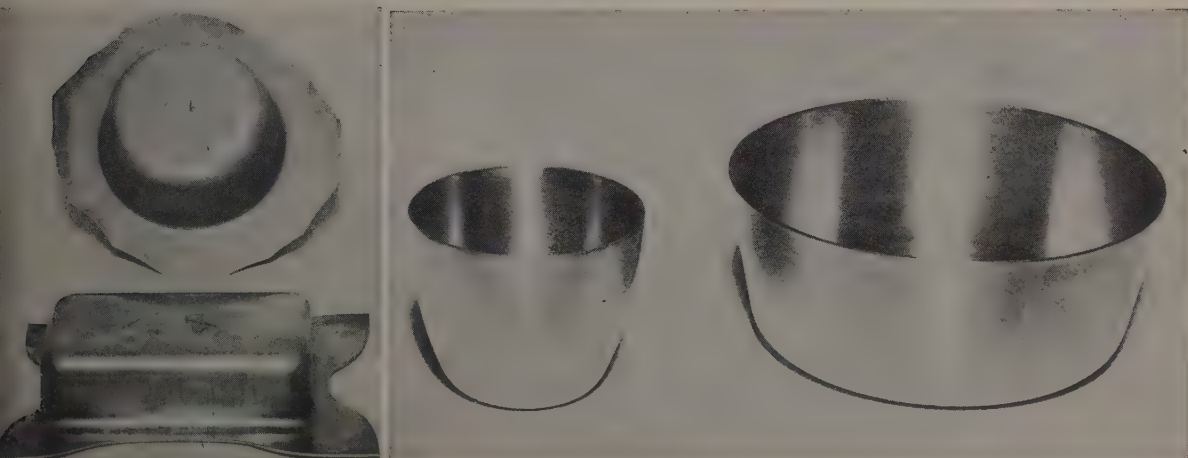
Like stainless, soft zirconium work hardens fast, and if any cutting is necessary, tools must be kept sharp.

Machining—Coolants are widely

used, although dry machining can be done at 100 sfpm, a cutting depth of $\frac{1}{8}$ -in. and a feed of 0.032 in. per revolution.

The best tool is tungsten carbide, but high speed steels are good. Use 10 degrees of front clearance, 7 degrees of side clearance and 0 to 10 degree side and back rakes for all cutting tools.

Drilling and grinding require slower operating speeds than are



zirconium crucibles and deep dishes like these are drawn in a single operation at 650 to 800 F. Plenty of colloidal graphite lubricant prevents seizing



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likely under the heading Bars, Bronze or Bearings, Bronze. Your Bunting Distributor is an industrial distributor or a specialist in certain industrial items. He has been especially selected for his responsibility and his understanding of bearing requirements. Ask him for the Bunting Catalog or write.



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common for steel. If you are grinding zirconium, remember that it is in common with aluminum and brass it will load up the wheel. Softer bonds are called for, so consult the grinding wheel supplier for the best grades.

Zirconium is quite ductile. Machine design practices for magnesium and titanium work well for cutting, drawing and forming.

Deep Drawing—Use 650 to 800 F and colloidal graphite lubricant for best results. A single operation will produce a deeper draw than is possible with steel, aluminum or brass. Deep drawing in a single operation eliminates the need for staging dies and intermediate annealing.

Brazing and Welding—Zirconium absorbs and unites with oxygen, hydrogen and nitrogen at high temperatures. Welding and brazing must be protected by an inert gas, such as argon or neon, although spot welding is successful without such protection. A successful method of continuous furnace brazing with silver or silver-manganese alloy has been developed for production use.

This article was prepared with the help of Brooks & Perkins, Detroit

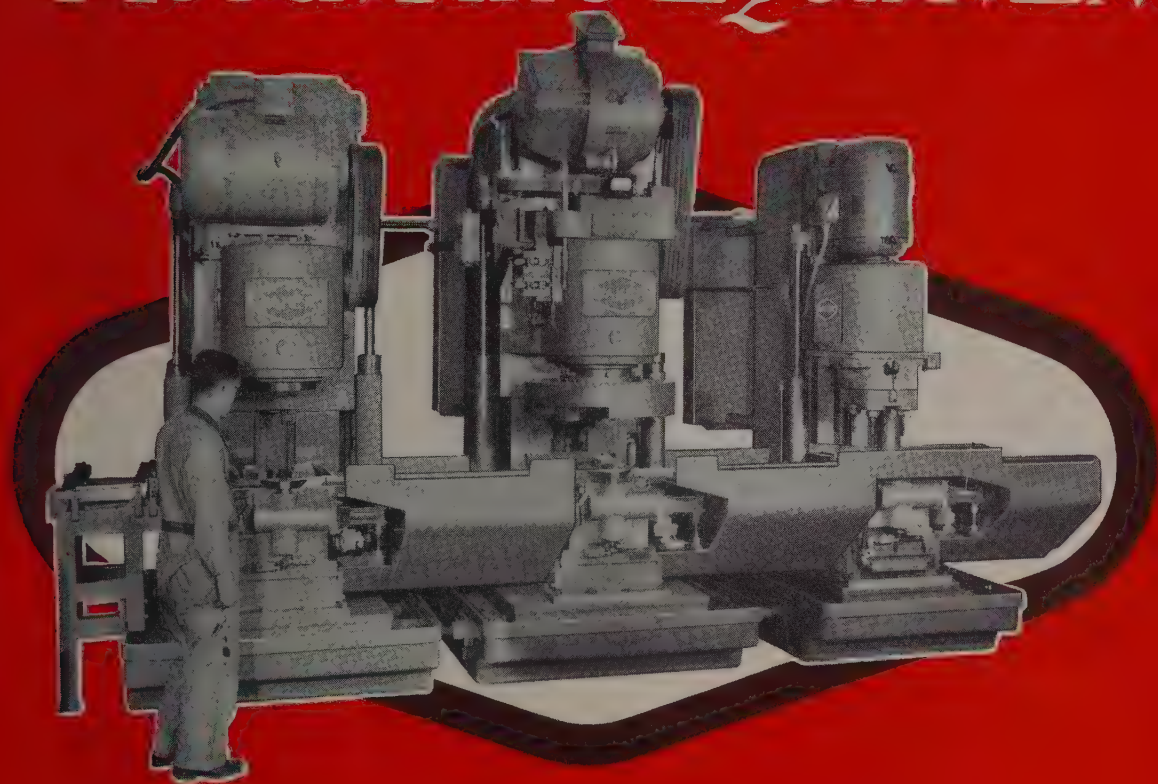
Forging — Fortunately, forging temperatures are well below critical temperatures for gas absorption. Zirconium ingots can be forged at 1600°F.

The forging rate is not so critical as it is with magnesium. Hydraulic presses, steam and hammers are equally successful. Initial working should be done with light blows to break up the cast structure.

Rolling and Extruding—Hot rolling will produce gages of 0.040 to 0.050 in. In cold rolling, the rapid work hardening occurs during the first 10 to 20 per cent reduction. The rate is much slower thereafter.

Rods, tubes and shapes are successfully extruded, but take precautions to prevent seizing by using colloidal graphite as a lubricant.

The Average Shop Needs and Now Can Afford *AUTOMATIC EQUIPMENT*



The new three standard unit Baker Machine introduced at the show, is combined to operate as a transfer machine, set up with a low cost, simplified fixture, proving the possibility of providing automatic machines through use of STANDARD MACHINES . . . And thereby achieving automation without tremendous expenditure. Operations on the new Baker Transfer are Combination Bore & Counterbore . . . Face (cross feed) . . . and Multiple Drill . . . All Automatically. Write regarding your specific job problems.

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Timing mechanism tubes come from the nickel alloy plating bath at the Century Plating Co., White Plains, N. Y.

Tin-Nickel Alloy Shows Plating Promise

TIN-NICKEL, a little known plating alloy, is getting a start in this country at the Century Plating Co., White Plains, N. Y. The Tin Research Institute in England developed the 65 per cent tin, 35 per cent nickel process.

Its versatility has been proved by use in plating products ranging from timing mechanism parts to 180-lb valves for the chemical industry.

Advantages — "Wherever corrosion, friction or increasing the service life of parts is a factor," says Louis Morin, sales engineer and chief plater for Century, "tin-nickel alloy plate has advantages." He lists some of them as:

Corrosion Resistance: Equal to nickel chrome and superior to either tin or nickel where these are considered in handling acids, alkalies and organic materials. Nontarnishing.

Hardness: 600-700 Vickers Pyra-

mid Number. Despite its hardness, thicknesses up to 0.012 in. will withstand grinding without cracking.

Bearing Qualities: Tin-nickel plated brass gear trains resulted in a 20 per cent reduction in friction.

Solderability: Solders readily with a noncorrosive flux with lead-tin base solders.

Color: Chrome-like with a slight pinkish cast which makes it an excellent color match with stainless steel.

Another attribute is exceptional throwing power. Regardless of the size or shape of the item being plated, whether in barrel or still tank, tin-nickel penetrates the deep recesses with ordinary plating procedures. It has relatively flat plating distribution which permits precision thickness control.

Problem Solver—One production

problem solved by Century with tin-nickel was a tubular case containing a timing mechanism checking device used by jewelers and the military. The containers are made of steel and brass and have open ends for the insertion of the timing mechanism. The ends were then capped and sealed with solder.

The tin-nickel plating on the case had no tendency to discolor, besides being nonmagnetic, non-corrosive and adaptable to soldering.

Pickaback Transfer

Robot car carries pallet of production parts through many operations

TRANSFORMER impregnating is made faster and easier at GE's Fort Wayne, Ind., plant because of an automatic transfer robot. Built like a small flatcar, it carries another car on its back to load and unload a pallet of transformers through a series of ovens and impregnators.

Features—Once the operation is started, the car carries its load through the complete cycle without further prompting. A pallet placed on the top car moves into a preheating oven at the first station. After the preheating period, the robot unloads the oven and at preset intervals continues to load and unload the pallet at the successive stations.

Tracks run past the loading doors. As the bottom car moves itself into position, the top or pickaback car can place the pallet on either side of the track. Hydraulically operated screws furnish the vertical movement needed to pick up or set down.

More Uses—Many other applications are expected because the car moves in six directions in three dimensions: up and down, forward and back and from side to side.

All movements of the car are electrically controlled. Limit switches can position the car to within 1/8-in.



Operation Big Test

EXPERIMENTAL STUDIES, heretofore unfeasible, can be made with the 5-million-ton capacity, universal testing machine installed at Fritz Engineering Laboratory, Lehigh University, Bethlehem, Pa.

Specimens or structures up to 40 ft high can be tested in tension above the sensitive crosshead. Below the crosshead, the unit can handle structures up to 100 ft long, 40 ft high and nearly 10 ft wide in compression tests.

Significance—The high-capacity machine will make design information from tests on large structures available to engineers. These data will eliminate much of the theoretical extrapolation of test results from sample or cut specimens.

Testing of complete structures will give information on varying properties throughout large rolled sections or forgings. It can reveal points of high stress that cause structural failure.

Operation — Loads are applied

hydraulically by a movable cylinder on a stationary piston, mounted on the base of the machine. The cylinder carries two vertical screws through which loads are applied on test specimens. They are in tension under a test load.

The load-measuring system is hydraulic and independent of the loading system. Guaranteed accuracy is within 0.5 per cent of the dial reading. Load variations as small as 20 lb can be indicated.

Other Equipment—The laboratory also has an integrated set of jacks, pumps and load measuring devices for applying and measuring repeated loads on structures and machine parts. They make it possible to study the behavior of structures under conditions approximating service. This equipment was made by the Amsler Co., Schaffhausen, Switzerland. The universal tester was built by Baldwin-Lima-Hamilton Corp., Philadelphia.

MORE RIGID

...yet it costs
less to make from
welded steel

THIS base for a precision drilling machine shows what benefits can be realized by proper design for welded steel.

40% less material is now used ... yet the design is considerably more rigid. Alignment tolerances of .017" on the original base are held to .002" in the welded design.

The cost is considerably lower than the original cast construction.

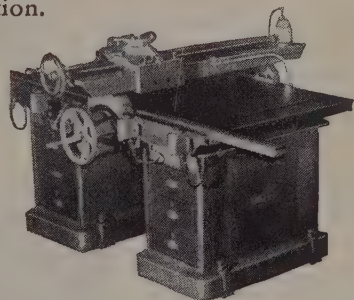


Fig. 1. Welded Steel Base for Wales-Strippit Company, N. Tonawanda, N. Y. Designed using the Lincoln WELDesign System.

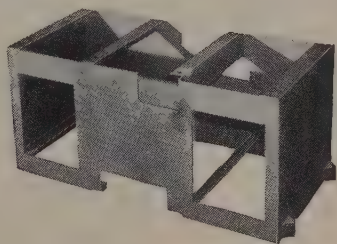


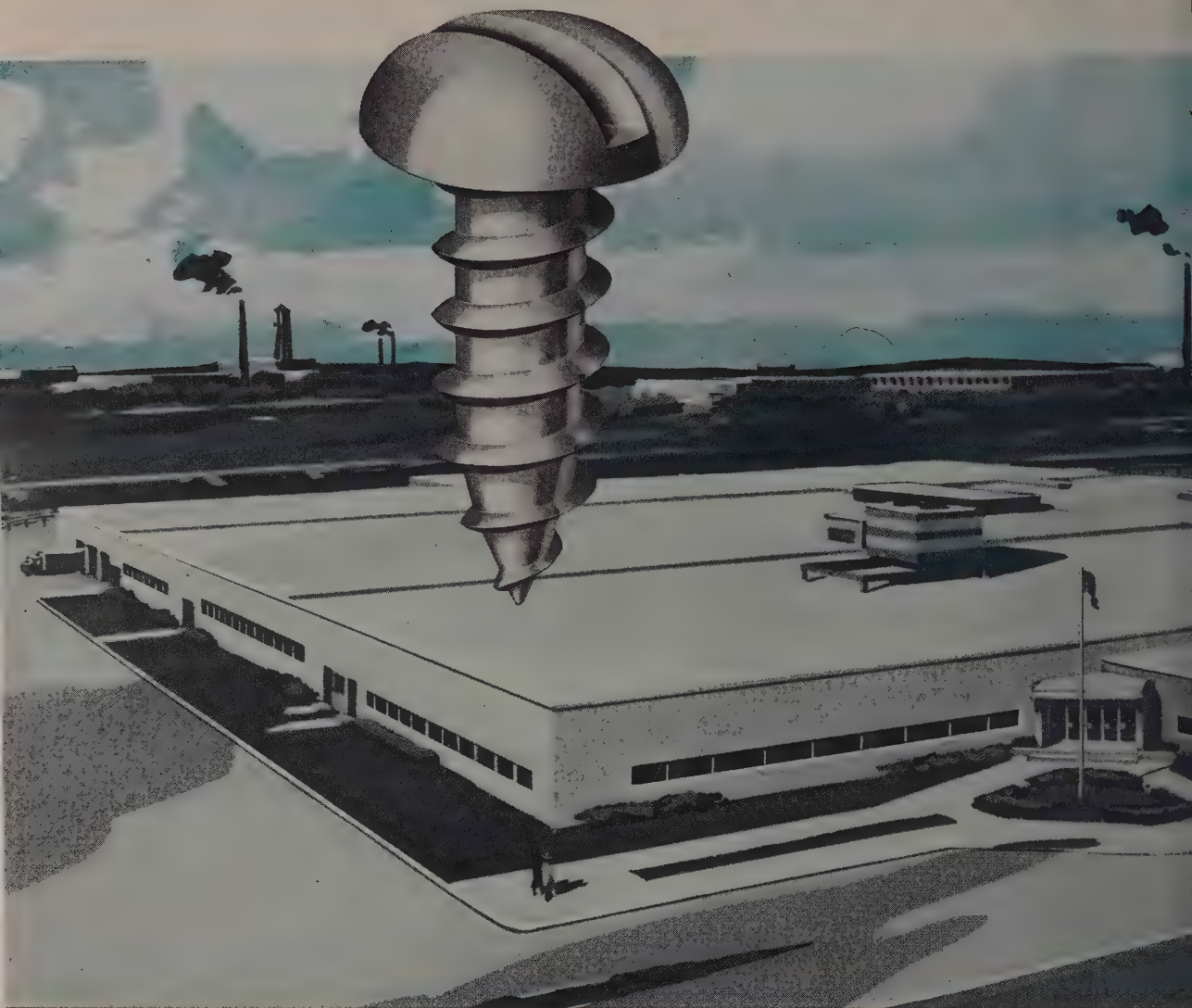
Fig. 2. Former Design had cast sections that were shipped in parts and aligned in customer's shop.

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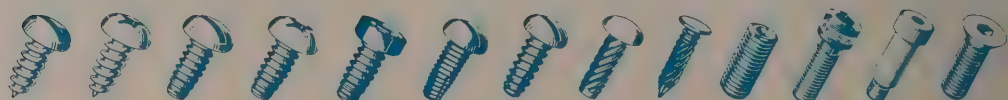
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The key to advanced design in many products is improved metals. Westinghouse hopes to get them faster because at Blairsville, Pa., its . . .



Three induction melting furnaces, varying from 3000 to 5000 lb, are used to make ingots of special alloys

Pilot Plant Links Lab to Production

THE NEWEST thing in metal development is a team of specialists working with production equipment to close the gap between test tube and manufacturing. This is the reasoning back of the \$6-million

metal pilot plant opened by Westinghouse Corp.

The plant can process both wrought and cast alloys with equipment which is both flexible enough and large enough to simulate ac-

tual manufacturing conditions.

Factory, Too—Blairsville differs from most pilot plants because it turns out a moderate amount of production parts.

"Equipment is larger than that

Messrs. Sam Damon and D. Rabenold are metallurgists in the materials manufacturing department. In this article they tell why...

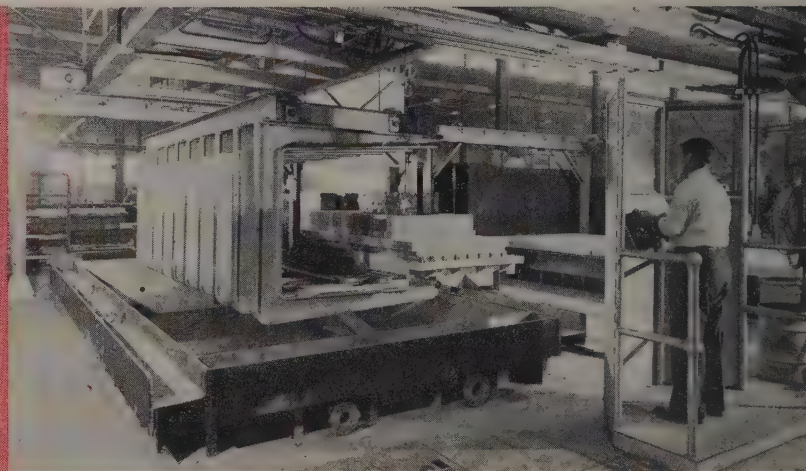


Fig. 1—High temperature solution heat treating furnace moves load from furnace into either oil or water quench tank in 20 seconds

Heat Treating at Blairsville Is Versatile

A METALLURGICAL facility like ours requires a variety of furnaces. Often, the right kind of heat treating is the answer to supermetals with extraordinary properties.

Example: Alloys of large cross

section, with homogeneous properties throughout. Since mechanical working alone cannot do this, metallurgists use precipitation hardened alloys. They require 1 to 2 hours of heating at 1800 to 2200° F

for the solution of alloying elements.

This is followed by an aging treatment. The solution treated metal is held for 16 to 50 hours at 1200 to 1400° F. Some applica-

found in most pilot plants," says Warren M. Trigg, manager of Westinghouse's materials manufacturing department. He explains: "This permits the manufacture of special metal products at competitive costs. More work is done by tools which normally cannot be fully loaded on development work.

"This operating policy not only lowers the cost of development work but also provides trained operating crews for all equipment—

an important consideration for effective pilot plant service."

Proof of Pudding—The manufacture of sizable quantities of a new product usually will reveal many problems that do not come to light by any other method, explains Mr. Trigg, adding:

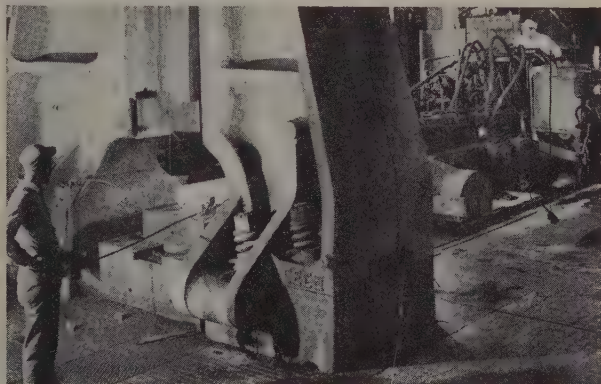
"The discipline of meeting production schedules proves the practicality of new processes. Demonstration in production equipment minimizes problems when the proc-

ess is transferred to a supplier's plant."

Fields—Although the facility has been generalized to satisfy Westinghouse requirements for some years to come, work at present will be concentrated on high temperature materials, hard and soft magnetic materials, expansion and resistance alloys, special foundry and powder metallurgy processes and nuclear fuel element manufacturing techniques.

Hot metal goes into shell molds to make specialty parts or to try out process for new use

This 18,000-lb forging hammer is designed for both open and closed die work



tions call for a double age where a slightly lower temperature treatment is given to stabilize properties.

Equipment — Fig. 1 (left) shows the natural-gas-fired, car-type furnace we use for solution treating such alloys. It is rated at 7 million Btu per hour and has a top temperature of 2400° F. Charges 18 ft long, weighing up to 10,000 lb, can be treated. Design of the car and overhead crane permits a charge to be removed from the furnace and lowered into either a water or oil quench in 20 seconds, to insure proper solution treatment.

In small batch solution treatment of age hardening alloys for experimental or control purposes, we often use the flexible facilities of our controlled atmosphere furnaces. Example: A special heat of Discaloy (a Westinghouse, high-temperature, iron-base disc alloy) may require temperatures differing from the standard heat treatment.

The right temperature and time can be quickly found in these smaller furnaces. They are Globar heated, will go up to 2550° F and are

supplied with a choice of controlled atmospheres.

Lower Temperature—A furnace that goes to 1800° F is used for aging. It holds the same size charge as the solution treating furnace. With special programming controls, any combination of temperature rise, soak and temperature fall can be obtained.

Temperature control of $\pm 5^\circ$ F is needed for high temperature alloy aging. Discaloy discs are aged 20 hours at 1350° F, cooled in 5 hours to 1200° F, followed by 20 hours at 1200° F.

With these furnaces, engineers can verify laboratory test results on a larger scale. They can get the accurate control needed to produce quality material.

Steel Heat Treating — Although Blairsville is primarily set up to handle special alloys, some work is done on forging and heat treating common SAE steels. The furnaces described are used also in the usual operations of heating for quenching, normalizing, annealing and tempering.

By adjusting the heat input, steel

forgings can be heated at various rates and quenched rapidly at the proper time. Annealing, normalizing and tempering are accurately controlled.

Coils—We use cylindrical, batch-type bell furnaces (Fig. 2) in bright

Fig. 2—Bell-type furnaces are used in bright annealing and heat treating thin strip



There's STAINLESS for Infants, too!

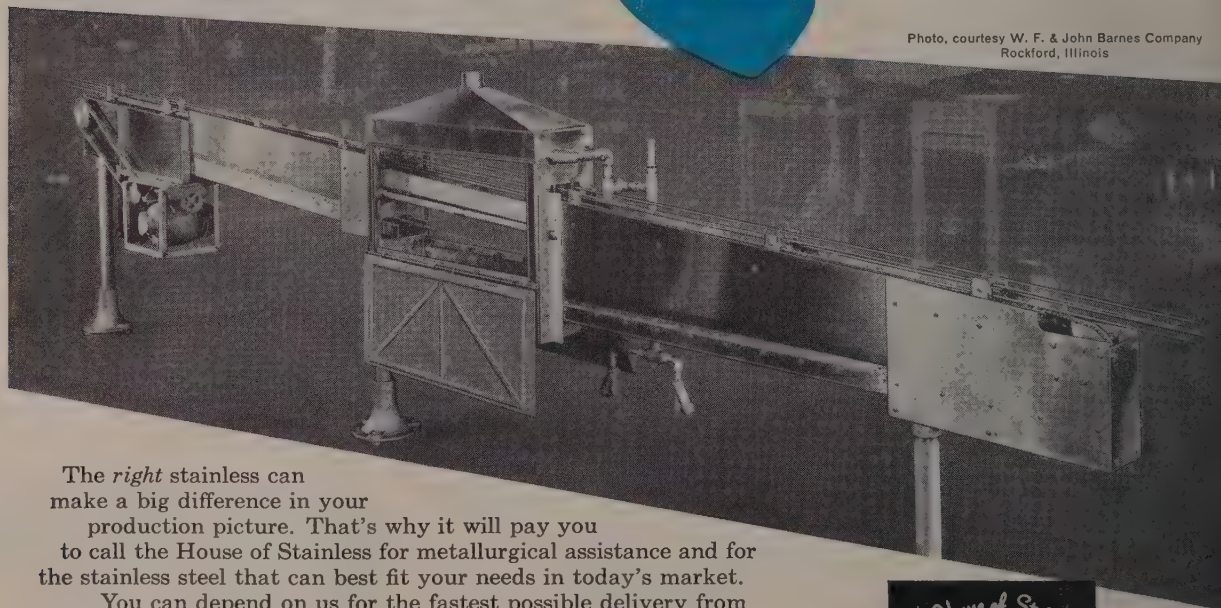
How the Right Stainless Safeguards Both Product and Equipment in the Handling of Baby Foods



THE NEED • When W. F. & John Barnes Company, custom builders of process equipment, were commissioned by a leading meat packer to design special conveying and washing machinery for the handling of canned baby foods, they had to meet all-important sanitation conditions. The washing chamber required material that would stand up under constant exposure to moisture and heat in performing its primary function. Likewise, the entire unit had to withstand the corrosive action of frequent cleaning demanded by the need for sanitation.

THE ANSWER • Here was a "natural" for stainless, but with so many different types available, Barnes engineers wanted to be sure that the proper grade and type was used. They turned to the House of Stainless to recommend the specific stainless that would best meet these severe conditions.

Photo, courtesy W. F. & John Barnes Company
Rockford, Illinois



The right stainless can make a big difference in your production picture. That's why it will pay you to call the House of Stainless for metallurgical assistance and for the stainless steel that can best fit your needs in today's market.

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Appleton, Wisconsin.

Heat Treating at Blairsville

annealing and in developing heat treatments for thin gage strip. With charge dimensions of 36 in. in diameter and 48 in. high, up to 3000 lb of coiled metal can be processed at one time.

Electrically heated and controlled by a combination of electronic contactors and chart recorder-controllers, these furnaces are held to $\pm 5^\circ$ F. Atmospheres of Ammogas (dissociated ammonia), hydrogen and nitrogen are interchangeable. With standard drying equipment, a dew point of -60° C can be reached. By passing the gas through "wetters," a water saturated gas is obtained which is effective in decarburization.

Vacuum — We plan to install vacuum annealing furnaces for heat treating reactive metals such as titanium and zirconium. This technique might also be applied to strip materials which would benefit from surface purification of the vacuum treatment.

Also being considered are intermediate-size, pit-type furnaces and equipment for vertical quenching needed for hardening straight shafts and other parts of high length to cross-section ratio.

Atmosphere — The bright heat treating of stainless and tool steels and bright annealing and heat processing of other oxidizable al-

loys call for special control of atmospheres.

For example, martensitic stainless Type 410 requires a dry (-40° C dew point) Ammogas atmosphere or hydrogen for bright hardening. A battery of muffle furnaces and several Bell furnaces are used.

A number of conventional, brick-lined furnaces are used in treating standard grades of air, oil or water hardening steels. Generally, the atmosphere used is Endogas (a mixture of gases, with carbon pressure in equilibrium with carbon content of the metal being treated).

Forging and Rolling—Furnaces used for forging and rolling are gas fired, using natural gas with a sulphur content of less than 0.1 grams per 100 cu ft.

Clean atmosphere for heating is obtained which can be adjusted for oxidizing and reducing conditions. Temperature control maintains $\pm 10^\circ$ F throughout the furnace charge space which measures 10 x 7 x 4 ft.

Close control of temperature and atmosphere is important in producing special alloys for magnetic, electrical and high temperature applications. Aside from the main requirement of getting material hot enough to deform plastically (without excessive surface defects), there is the all-important requirement of grain-size control.

Most of these special alloys are later cold worked or heat treated.

The grain size resulting from hot forming is important in determining final grain size and properties.

Surface Treatment — Treating metals for needed surface properties is another field in which we are working.

Gas carburizing is carried out in batch-type or continuous furnaces. Controlled carbon pressure by the use of Endogas or Monogas permits pilot plant work in recarburization and the prevention of carbon loss during annealing or hardening.

The same furnaces using the same gases are available for development work on carbonitriding or bright annealing.

A pit-type furnace is used for nitriding, as well as for controlled atmosphere aging and tempering. Ammonia requirements are met by a 13,000-gallon storage tank.

The protective atmosphere requirements of aging and tempering treatments are met with Exogas—its ratio is altered to suit needed conditions of carbon potential and dew point.

Brazing — We are interested in exploring economies that can come from full utilization of furnace brazing techniques. Here, new alloys, difficult to braze, as well as untested high temperature brazing alloys, are examined critically; special methods and atmospheres are devised to use them on a production basis. Where available atmospheres or fluxes do not meet requirements, it is possible to carry out vacuum brazing tests.

Sintering — Our powder metallurgy department can sinter parts at high rates, using a two-zone, mechanical, pusher-type furnace (Fig. 3).

For the development of new sintered alloys and special contact materials, a high temperature molybdenum element furnace is used. It goes up to 3270° F. Ammogas is the atmosphere generally used in the powder metal section. However, here, as in the entire heat treating pilot plant, a manifold system will feed any atmosphere to any furnace.

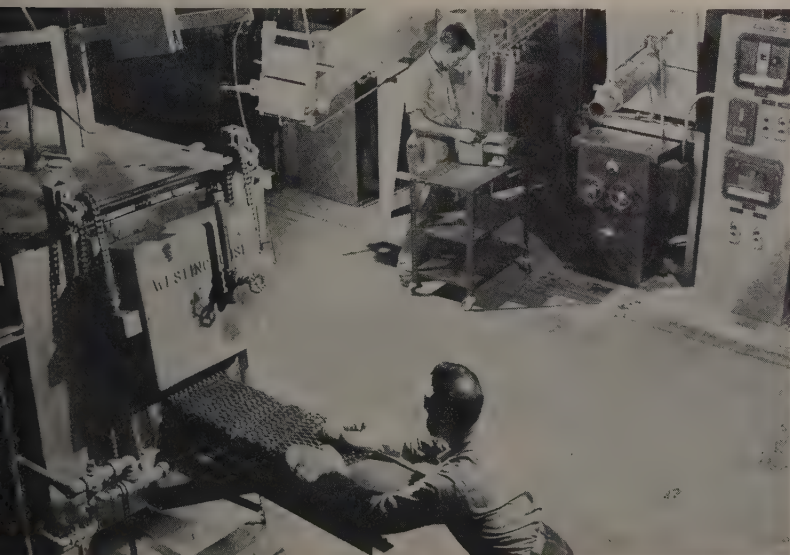
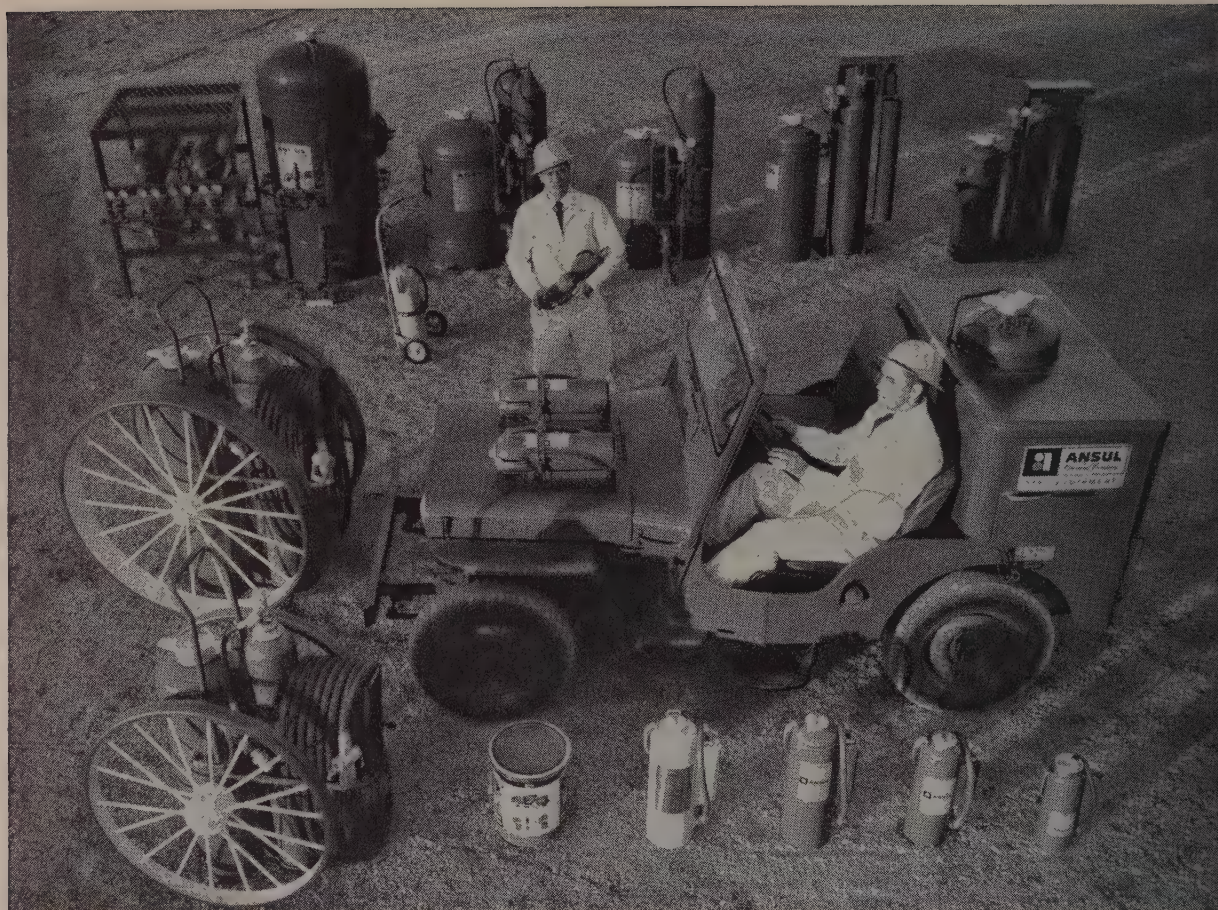


Fig. 3—Pusher-type furnace is used in powder metallurgy and brazing. Special furnaces (background) are used in development work

• Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.



The Ansul dry chemical fire equipment pictured above includes portable hand units, wheeled and stationary units and a jeep installation. Ansul also manufactures automatic

dry chemical piped systems, custom engineered for the hazard. Ansul equipment is listed and approved by Underwriters' and Factory Mutual Laboratories.

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Special design and construction features make this warranty possible. Ansul's *weather-tight* construction keeps out moisture, resists corrosion. *Patented nozzles* deliver the right kind of stream for your hazard. A *sealed pressure cartridge* puts Ansul's "Plus Fifty" dry chemical to work immediately—no delay or lag. Finally, *rugged construction* makes it possible for Ansul equipment to give peak performance under the toughest operating conditions.

Call the **Ansul Man!**

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Division, Dept. F-133, Marinette, Wisconsin. Write Ansul for your copy of new Fire Equipment Catalog.



ANSUL

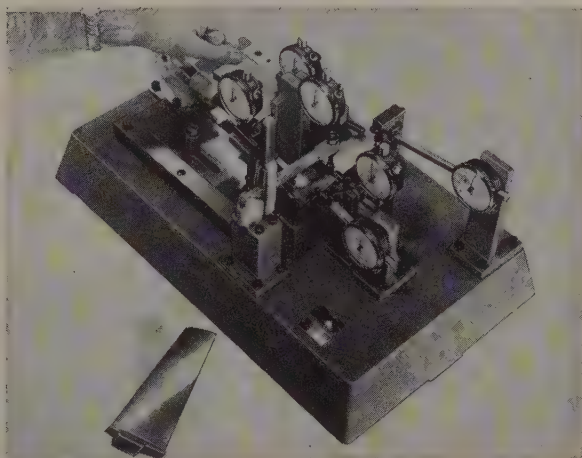
Multiple Dial Indicators Check Jet Engine Blades

The dependable accuracy and versatility of dial indicators are put to good use in jet engine inspection. In checking compressor blades, thickness is measured at six different points simultaneously by a series of multiple-dimension dial indicator gages.

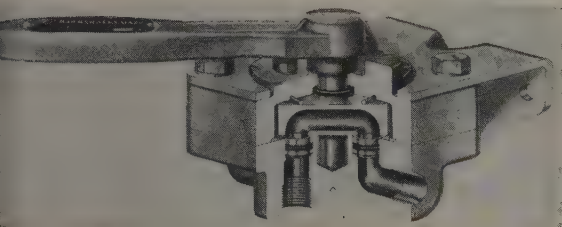
At inspection, a blade is placed in the gage where it rests on three points and is located from its trailing edge and root. A spring-loaded plunger holds the blade in position.

A hand lever moves the gaging contact into position, and the dial indicators show any deviation in thickness at six separate locations.

In this application, dial indicators are ideal. They provide ample accuracy with high magnification. Dimensional variations are clearly indicated. Write: Federal Products Corp., 1144 Eddy St., Providence 1, R.I. Phone: Stuart 1-9300



Four-Way Air Valve Controls Up to 250 Psi



Any port of the valve can be used as the pressure port. The valve body can be rotated in 90-degree intervals for the most convenient piping.

A sturdy mounting bracket furnished with the valve also can be turned where you want it.

The valves come in $\frac{1}{4}$ and $\frac{3}{8}$ -in. sizes. Write: Barksdale Valves, 5125 Alcoa Ave., Los Angeles 58, Calif. Phone: Ludlow 7-6181

New Spot Welder Is Portable

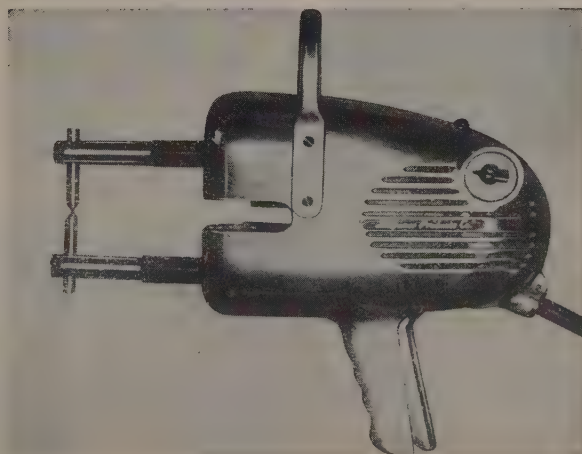
Here is a spot welder for light production runs; it also has many uses in maintenance.

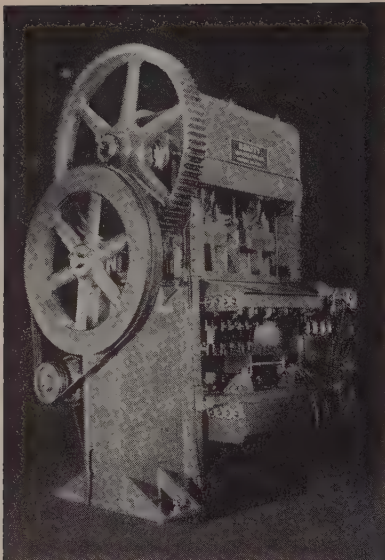
A combined thickness of $\frac{3}{16}$ -in. of cold rolled steel can be welded.

Model 55 is ruggedly built. It has an electronic timing control which operates a solenoid contactor mounted on the end of the power cable. A Hubbell twist-lock male plug completes the assembly.

The welder is easy to operate. Because of the built-in electronic timing control, all the operator needs to do is set the dial and squeeze the handle. The machine does the work.

A larger welder is made for production work. It has built-in electronic timing control and solenoid contactor. Transformer arms and tips are water cooled. Write: Ampower Products Co., P.O. Box 464, Oak Lawn, Ill. Phone: Garden 2-0305



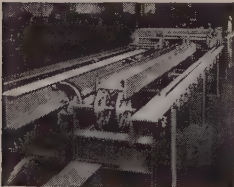


GUILLOTINE BEAM WEB PUNCH

Six individually controlled punching units with automatically synchronized punch and die, facilitate setting up to various gauge lines. 33" max. setting to outside units; 2 1/8" min. setting between units. 200 ton cap.

GUILLOTINE BEAM FLANGE PUNCH

A turn of a handwheel changes punching centers and synchronizes punch with die. Four punching units, with 2 1/4" - 6 3/4" setting between inside and outside punches, adjustable 2 1/4" - 3 1/2". 200 ton cap.



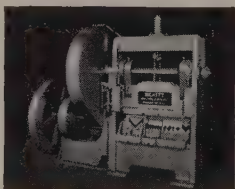
BEATTY Spacing Table handles web and flange punching without roll adjustment.



BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.



BEATTY Gap Type Press for forming, bending, flanging, pressing. 250 ton cap.

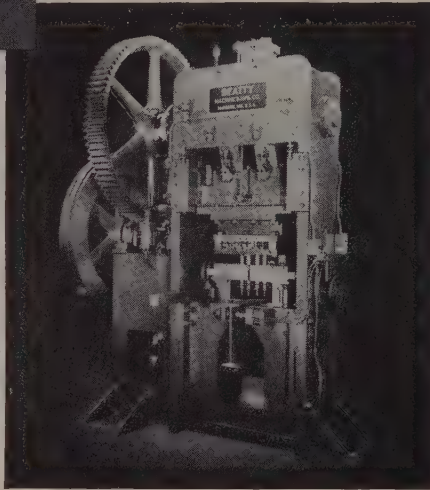


BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.

FASTER

WEB and FLANGE PUNCHING

Beatty Built-in Adjustable Tools Save Set-up Time



REDUCE COSTS ON "SHORT-ORDER" PUNCHING

Take the high costs out of "short order" punching with these versatile BEATTY Guillotine Beam Punches. They're especially designed to reduce costs in handling short run web and flange punching where punching arrangements are frequently changed.

Incorporating entirely new time-saving adjustable tools that eliminate expensive setting up time, reduce down time . . . these BEATTY machines have lowered costs by as much as 75% on some metal fabricating jobs.

Dependable, accurate fast . . . BEATTY machines (standard models or custom-built to your specifications) can help solve your metal fabricating problems—reduce costs. Talk it over with a Beatty engineer!

BEATTY
MACHINE & MFG. CO.
HAMMOND, IND.

NEW PRODUCTS and equipment

Impact Wrench Calibrator

Steel erectors use this tool tightening high-strength bolts. calibrates wrenches for bolts 3/4, and 1-in. in diameter and 2 1/2 or more long.

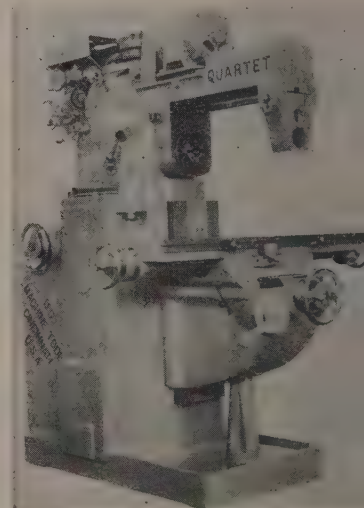
The gage shows direct bolt tension and the recommended value for each size.



The hydraulic calibrator weighs 50 lb. It is self-contained and conforms to recommended procedures. Write: Skidmore - Wilhelm Mfg. Co., 442 Green Rd., Cleveland, Ohio. Phone: Ivanhoe 1-4774

Milling Machine

The horizontal spindle index for universal operations. It is mounted in a massive turret which

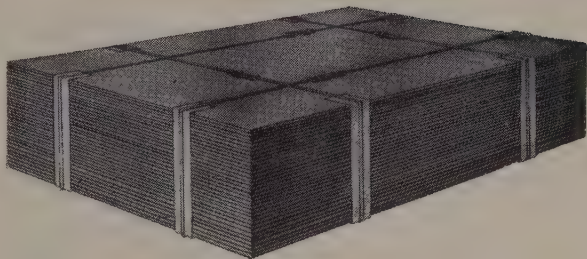


You'll find safety and savings in steel roof deck construction

Steel Roof decking has proved itself an outstanding material for industrial and commercial buildings. Strong, yet light in weight, steel roof decks are easy to apply and economical to maintain. They can be insulated to exact requirements . . . holding roof dead load to a minimum and permitting economy in the design of supporting structures.

The heavy demand for J&L sheet steel to be used in the manufacture of steel roof decks points up the growing acceptance for this method of construction. In addition, it provides evidence of the manufacturer's confidence in J&L's ability to furnish quality steel exactly to specification.

Whatever *your* product, whatever *your* requirements for formability, uniformity or drawing qualities, you can depend on J&L. You get the most out of your production equipment and add to the value of your finished products by using J&L sheet steel.



**serving steel users
everywhere —**

J&L's nation-wide distribution is supported by its location and facilities for prompt, dependable river, rail and truck shipments.



**J&L
STEEL**

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

NEW PRODUCTS and equipment

swivels 360 degrees.

When the machine is used as a universal horizontal miller, the spindle is indexed to the required angle, rather than swiveling the saddle. The table retains its inherent stability, and the turret locks at the desired angle.

The machine has 30 in. of horizontal travel, 11 in. of cross travel and 16¼-in. of vertical travel.

Horizontal spindle speeds are infinitely variable from 29 to 1450 rpm. Both the horizontal and vertical spindles can be used simultaneously. The machine can be operated while the turret is being indexed.

It is easy to change from one type milling to another; both vertical and angular milling operations can be done. Write: U. S. Burke Machine Tool Division, Cincinnati Mfg. Corp., Brotherton Rd., Cincinnati, O. Phone: Bramble 5000

FOUND WHERE WORLD FAMOUS TRACTORS ARE "BORN"

GRAND RAPIDS GRINDERS



CATERPILLAR



ALLIS-CHALMERS



CASE



DEERE



INTERNATIONAL HARVESTER

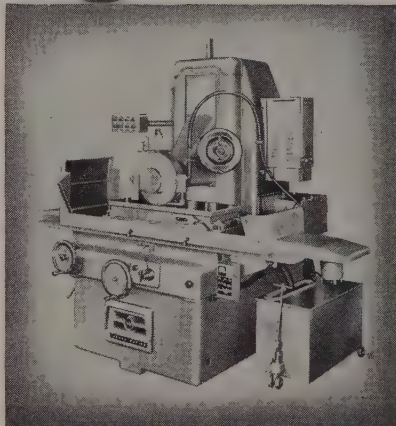


P. O. LeTOURNEAU



MASSEY-HARRIS-FERGUSON

The makers of these famous tractors and allied heavy-duty equipment use Grand Rapids Grinders in their toolrooms. In fact, you'll find Grand Rapids Grinders wherever manufacturers place a premium on precision... because they're designed and built for lifetime precision grinding. Take our Model 560, shown at right. Its column and base are a massive, one-piece casting for permanent, rigid alignment. Wheel head has powered rapid vertical travel; cross feed and longitudinal travel table are hydraulically actuated. Table speed is variable up to 140 fpm, making this the *fastest* grinder of its type and size! If you're not already enjoying these standout features in your toolroom, a note on your letterhead will bring full details.



Grand Rapids No. 560 Hydraulic Feed Surface Grinder. Table speed up to 140 fpm. Working surface of table is 14" x 36". Vertical movement of wheel head is 18". Preloaded ball bearing spindle greased for life. Spindle speeds 1800 and 2140 rpm.



GALLMEYER & LIVINGSTON CO.

Write for full information.



407 STRAIGHT AVE., S.W. GRAND RAPIDS, MICHIGAN

Spray Washing Machine

This packaged washing machine is built in standard sizes to carbonitriding furnace trays.

Spray nozzles above and below the work are supplied by a 2 gpm pump which is driven by a 2-hp motor.



The washer has magnetic starters, automatic temperature control, a pilot safety device and a timer which shuts off the pump at the end of the cycle.

Storage capacity is 500 gallons. Straight-through designs and multistage units with rinse and dry sections available. Write: Waukegan Engineering Co. Inc., 407 E. Michigan St., Milwaukee 2, Wis. Phone: Broadway 2-2317

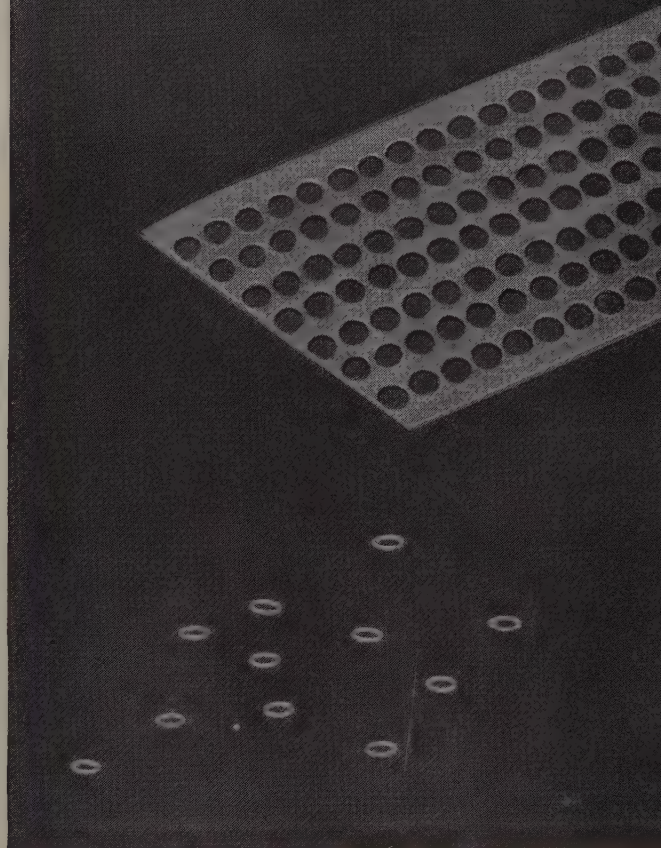
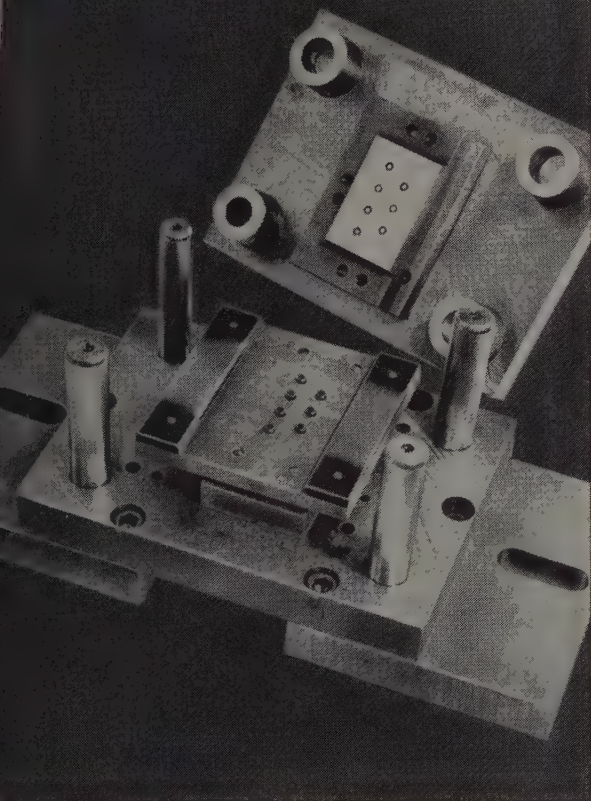
Grappler

Grapples and a magnet are combined to increase pickup capacity two to three times.



Four keenly pointed tines give better penetration into all types of scrap metals. The unit handles

FIELD REPORT: NO. 87



WHICH DIE STEEL WOULD YOU USE HERE to boost production per grind 500%?

These tools blank out dead soft brass washers, .170" O.D. x .100" I.D., .009" thick, on a punch press at 186 strokes per minute. It is an exacting job for a couple of reasons. First, it involves a government contract and strict delivery schedules have to be maintained. Then too, the punch and die are set up to blank seven washers per stroke and have to do this for many millions of pieces . . . and still remain within burr limitations set up by the government. Performance from the steel used in the past was far from satisfactory . . . to maintain schedules, production had to be substantially increased.

Suppose the decision were up to you. Which die steel would you be willing to recommend for steady, trouble-free production?

In this Field Report from customer files, here's what happened: The Carpenter Matched Set Diagram was consulted and Carpenter No. 610 (Air-Wear) was selected. Since then No. 610 has enabled the Company to hold delivery schedules comfortably . . . racking up increases in production per grind as high as 500%. And this is especially significant when you realize that five

hours' downtime is involved each time the tools have to be reground. Total parts to date: 5,500,000 . . . and the tool is still good for about 15 regrinds of .003" each.

Why make the tough decisions alone, when Carpenter's service organization is sincerely interested and equipped to work with you? A move in the right direction would be to call your nearest Carpenter Mill-Branch Warehouse, Office, or Distributor, now. The Carpenter Steel Co., 139 W. Bern St., Reading, Pa.

Your toolroom can use Carpenter Matched Tool and Die Steels to:



- Reduce hardening hazards
- Minimize machine downtime
- Boost output per grind
- Improve product quality

Carpenter

Matched Tool and Die Steels



IMMEDIATE DELIVERY from local warehouse stocks—Export Address: Port Washington, N. Y.—“CARSTEEL.CO”

Replace MANY Packages with ONE

PALLETIZE YOUR PRODUCTS



STEEL STRAPPING

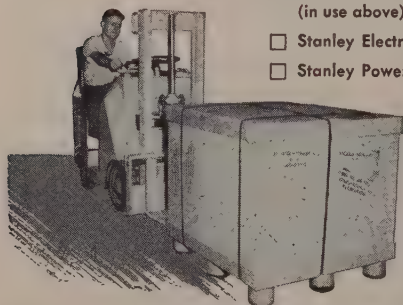
The Stant Manufacturing Company of Connorsville, Indiana is another progressive manufacturer added to a large and growing list of companies palletizing their products for safe, economical shipment with Stanley Steel Strapping.

FORMERLY: Stant shipped its taillight assemblies in numerous small corrugated cartons sealed with gummed tape, each carton requiring interior packing.

NOW: Stant uses the Stanley Steel Strapping System. 75 assemblies now are packed into one partitioned carton and strapped to an expendable pallet. This palletized unit is easily, safely handled in storage or en route to customer because it is reinforced and protected by the "sealed strength" of Stanley Steel Strapping. And the Plus cost-saving benefits are: less interior packing, fewer cartons, less handling and manpower required.

Stanley has a complete line of steel strapping hand and power tools for easier, faster, safer packing and shipping of boxes, cartons, crates, coils, bundles, skid-loads and pallet-loads.

- ☐ Stanley ACE Strapping Tool with Automatic Seal Feed (in use above)
- ☐ Stanley Electric Skid Magazine Tool
- ☐ Stanley Power Strapping Tool (Models SPS-1, SPS-2)
- ☐ Stanley Electric Car Banding Tool (Built-in Shear Optional)



Call in the Stanley Steel Strapping Specialist. He'll show you how to pack, move and ship more goods in less time at lower cost. Mail coupon for free catalog.

STANLEY

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STEEL STRAPPING DIVISION THE STANLEY WORKS

STANLEY STEEL STRAPPING DIVISION, 105D-S LAKE ST., NEW BRITAIN, CONN.
Telephone: Baldwin 9-2021

- ☐ Please send Catalog SS-9C. ☐ Please have Representative call.

NAME _____
POSITION _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____



STANLEY TOOLS • STANLEY HARDWARE • STANLEY ELECTRIC TOOLS
STANLEY STEEL STRAPPING • STANLEY STEEL

NEW PRODUCTS and equipment

bailing material, small, loose material or prepared scrap.

The grapple-magnet fits in 8-ft. truck body. The grapple weighs about 2300 lb; the magnet 1100 lb. Write: M. P. McCaffrey Inc., 2131 E. 25th St., Los Angeles, Calif. Phone: Ludlow 8-7181

Tow Truck

This electric, three-wheel tow truck has dual controls. The operator can stop and start it while riding or walking along either side.

The unit is ideal for "picking up" in warehouses. The controls are self-canceling when the operator removes his hand.



The truck operates on automotive-type batteries, which can be recharged by plugging into any 110-volt wall socket. Write: Tow Bear Division, Hudson House Inc., 401 S. E. Water St., Portland, Ore. Phone: Belmont 2-5161

Packaging Paper

This new paper combines volatile corrosion inhibitor chemicals with heat sealing properties.

With it, many metalworking and packaging industries now handling wrapping parts, can convert to automatic or semiautomatic operation. Write: Daubert Chemical Co., Chicago, Ill. Phone: Andover 3-4342

Gear Checker

Spur or helical internal gears with pitch diameters from 2 to 1 in. are inspected by this machine.

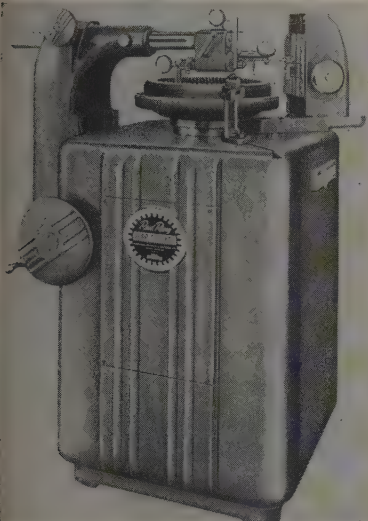
It checks tooth-to-tooth spacing, pitch or root diameter eccentricity and size, as well as the parallelism of spur gears.

The cast iron base supports precision, ball-bearing, vertical

NEW PRODUCTS and equipment

work spindle. The head that checks tooth spacing, size and eccentricity is mounted on an adjustable overarm.

The parallelism checking head is mounted on vertical ball slides in a casting on the top of the base checker.



The gear checker uses a 30 x 40-in. space. Write: National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. Phone: Walnut 1-8980

Roughness Sorter

Here is equipment that permits the addition of surface roughness inspection to automated production setups.

Parts are sorted according to microminch roughness measured along a diameter or flat surface, including tapers and parts with grooves or shoulders.

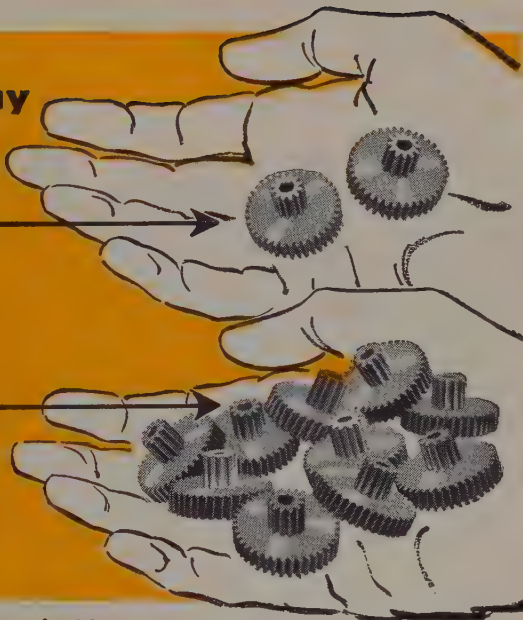
Each application is tailored to the user's requirements. Write: Micrometrical Mfg. Co., 345 S. Main St., Ann Arbor, Mich. Phone: Normandy 2-5626

Tube Piercing

Double-acting tube piercing units for press brakes and punch presses make clean, accurately located holes.

Standard tube capacities are from 1/2 to 1-in. OD. The maximum punch diameter is 0.312 in.;

You can buy
THIS
or
THIS
for the
SAME
DOLLAR



TWO machined parts . . . \$1.00

TEN Powdermet* PARTS . . . \$1.00 (10¢ each)

Don't cut parts—Cut Costs with YALE Powdered Metal Parts

Yes, powder metallurgy has an important price story—because when you save the extensive and costly operations involved in machining, it shows up in *more parts* and lower production costs!

But at Yale & Towne, there's another story of *equal* importance . . . *complete* engineering service, the kind you can trust—from consultation through production and delivery of parts that are *really* right!

Engineering service has given Yale & Towne its position of leadership in powder metallurgy. We are careful to *recommend only applications where Powdermet* parts will perform successfully*. Then, in design

and production of these parts, Yale & Towne offers the experience, know-how, modern facilities and creative ingenuity that *assure* best results.

As a part of this complete engineering service, Yale & Towne maintains a continuous special training program for well-qualified engineers. These men become Powdermet* consultants—available to discuss the advantages and limitations of Powdermet* parts *right in your own plant*. They will show you how Powdermet* may cut your production costs and improve your product. And there is *no obligation* for this engineering counsel.

TAKE ADVANTAGE of Yale & Towne's skilled engineering assistance on your powdered metal problems.

Arrange for a visit by a Yale & Towne consultant—today!

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Name.....Title.....

Company.....

Street Address.....

City.....Zone.....State.....

*Registered Trade Mark



Another sign of
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efficiency



— aided by **KINNEAR** Rolling Doors

Through more than 100 years of service, the Erie Railroad has kept pace with modern needs for quick, safe, low-cost freight-handling.

That's why, for many years, we've been glad to count the Erie among the many famous users of Kinnear Steel Rolling Doors.

Wherever goods, equipment, or rolling stock must be moved in and out of buildings—in any industrial or commercial activity—Kinnear Rolling Doors offer major advantages.

Opening straight upward, they coil completely out of the way, safe from damage. Whether opened, closed or in action, they permit full use of all sur-

rounding floor, wall and ceiling space. Their rugged, all metal, heavily galvanized * construction stands up under long, hard use, through toughest weather conditions. Built any size, with manual or electric control, they are easily installed in old or new buildings of any type or construction.

Like the Erie, a majority of America's leading railroads use Kinnear Rolling Doors because they've proved to be a sound investment in long-lasting low-cost, carefree efficiency. Write for the 1956 Kinnear catalog.

—with 1.25 ounces of pure zinc per sq. ft. of metal, ASTM standards.

The KINNEAR Mfg. Co.

FACTORIES:

1780-1800 Fields Avenue, Columbus 16, Ohio

1742 Yosemite Ave., San Francisco 24, Calif.

Offices and Agents in Principal Cities



NEW PRODUCTS and equipment

maximum wall thickness of tubing is 0.093-in. Special units for larger holes and tubing are available. Write: Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y. Phone: Ludlow 2711

Plating

Here is an automatic plating unit that is portable.

It has a selenium rectifier with automatic timer, stainless steel tank (which may serve as the anode) fitted with a water jacket for temperature control and a centralized control panel. A movable work rack holds a portable plating barrel. A filter and a dripproof pump, with motor, complete the unit.



Smooth, even deposits and high-quality plating are assured by constant motion of the solution around the work. A pump and stainless steel tube at the bottom of the tank do the agitating.

Units come in 10, 20 and 30-gallon capacities. They need only 18 x 38-in. of floor space. Write: Bart-Messing Corp., 229 Main St., Belleville 9, N. J. Phone: Plymouth 9-0200

Clutch Control

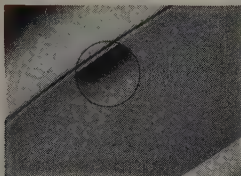
Production and operator safety are increased by a new, electric, two-hand clutch control for industrial machines.

Accidental operation of the clutch is impossible. The clutch can operate only when the control system is functioning properly.

The system prevents an unex-



▲ L-M pond-type chain saws "bucking" log for a veneer plant.



◀ Close-up of MAX-EL alloy steel chain saw bar, showing depth of heat treatment for tougher, longer-lasting bars.

it takes MAX-EL Alloy Steel to take a beating like this

Ram the flying teeth of a chain saw against a heavy log — and watch the sawdust fly! But don't forget — backing up that speeding chain is a bar that has to absorb all the shock . . . yet keep the chain lined up accurately, dependably.

That's a big reason why leading chain saw manufacturers, like L-M Equipment Company, Portland, Oregon, specify Crucible MAX-EL® alloy steel for chain saw bars.

And there are other reasons, too. For MAX-EL is not only tough, wear-resistant and dependable . . . but

it also shows outstanding response to heat treatment . . . excellent machinability . . . high uniformity . . . minimum distortion. It's these qualities that permit L-M to machine their saw bars first — *then* give them a graduated heat treatment that insures toughness at the edges . . . flexibility in the main section.

If your product requires a tough, machinable, non-deforming alloy steel — MAX-EL is for you. Try it. To see what information is available on MAX-EL — or any Crucible special steel — get your copy of the "Crucible Publication Catalog." Write *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

CRUCIBLE

first name in special purpose steels

Crucible Steel Company of America

IMPROVE YOUR PRODUCT AND CUT COST . . .

by letting Shenango handle all your annular, symmetrical or tubular part needs. They're centrifugally cast for pressure-dense grain, greater strength, better elongation and freedom from porosity, sand inclusions and blow holes. Machining is easy too, with less waste. Whether your plans call for tiny bushings or huge rolls, ferrous or non-ferrous, rough or finished, check with Shenango . . . and see how *you* stand to gain. Write: Shenango-Penn Mold Company, Centrifugal Castings Division, Dover, Ohio (Executive Offices: Pittsburgh, Pa.)

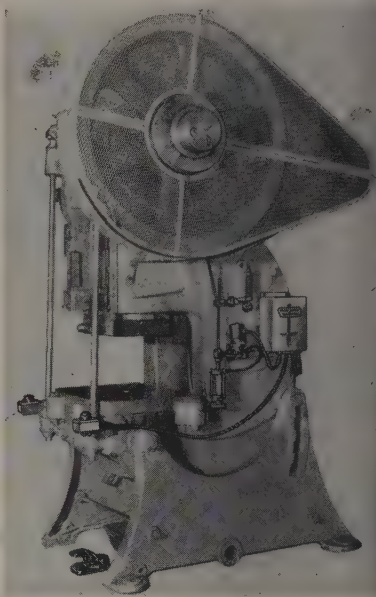


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ALUMINUM AND MANGANESE BRONZES • NI-RESIST • MEEHANITE METAL

NEW PRODUCTS and equipment



pected power stroke during setup. It is impossible to cheat on the machine by tying down one control switch. Write: Micro Switch Division, Minneapolis-Honeywell Regulator Co., Freeport, Ill.

Thermocouple

A new thermocouple (platinum, 30-per-cent rhodium—platinum, 6-per-cent rhodium calibration) is capable of measuring temperatures up to 1800°C (3272°F).

The thermocouple extends the practical range of temperature measurement without sacrificing sensitivity or corrosion resistance. Write: Thermo Electric Co. Inc., Saddle River Township, Rochelle Park P. O., N. J. Phone: Hubbard 9-5800

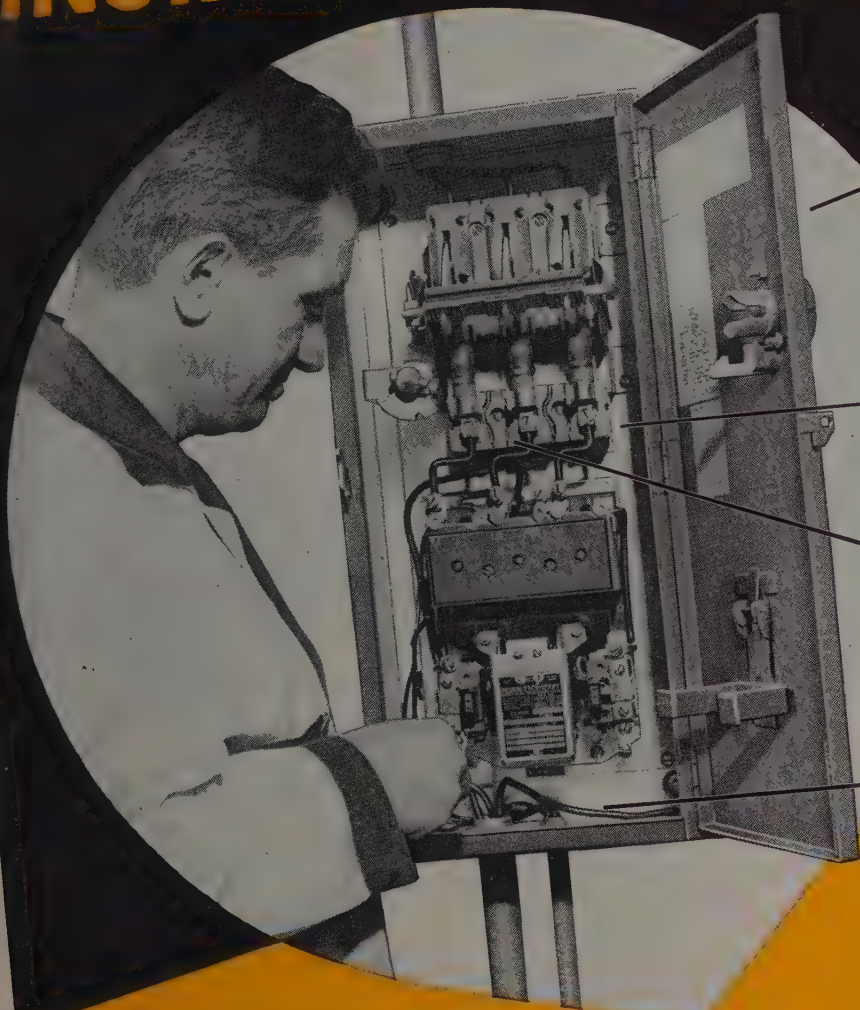
Clutches

Up to 100 per cent more torque capacity is given by Morlife clutch plates. They permit the use of smaller diameter and less expensive clutches.

Less lever or pedal pressure is needed for engaging and disengaging. The clutches are best adapted for heavy machines — tractors, trucks, shovels, bulldozers, tanks, earth movers and graders.

Work life of the clutches has been increased up to 400 per cent. Heat dissipation has been im-

EASIER TO INSTALL AND MAINTAIN!



mount 1 device
instead of 2

extra-wide
gutters

all
components
accessible
from front

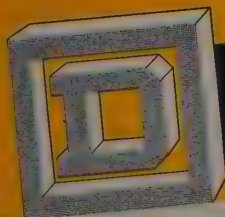
plenty of
knockouts

SQUARE D COMBINATION STARTERS

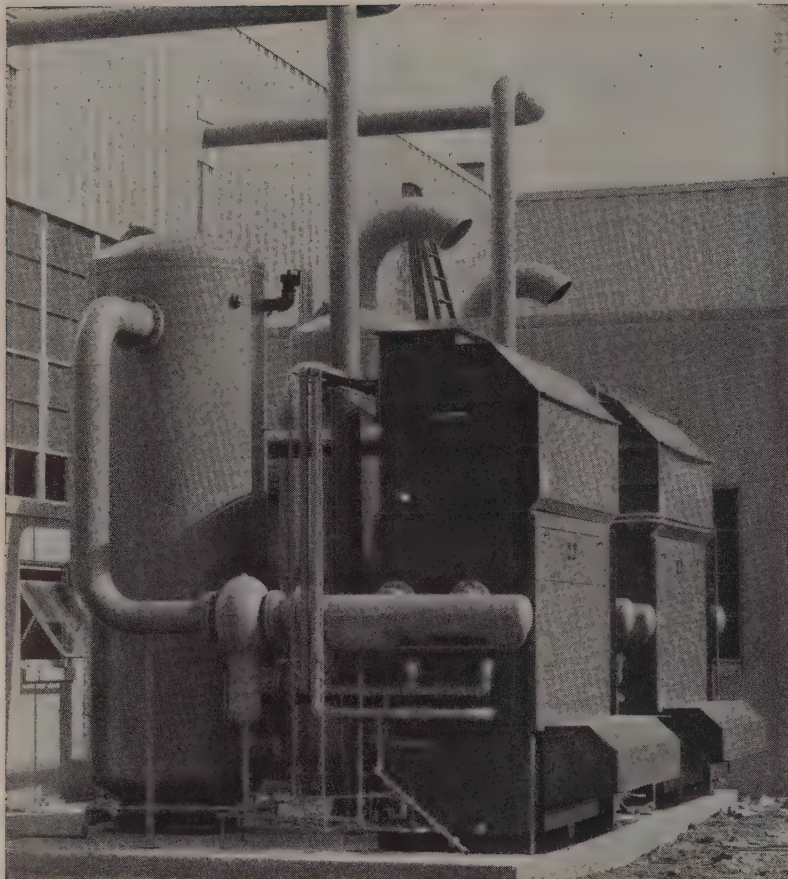
(Switch or Circuit Breaker Types)
Save space and time. Mount and wire
one device instead of two . . .
neater, more attractive installations.

Write for Bulletins 8538 and 8539
Square D Company, 4041 N. Richards Street, Milwaukee 12, Wisconsin

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS



SQUARE D COMPANY



This Niagara Aero After Cooler also cools compressor jacket and intercooler water.

COMPRESSED AIR... Lower in Cost Dependably Drier and Cooler Trustworthy for Instrument Use

THE NIAGARA AERO AFTER COOLER offers a completely self-contained method replacing both shell-and-tube cooler and cooling tower. It is independent of a large supply of cooling water and consistently reduces compressed air temperatures to below ambient. Its drier air gives you a better operation and lower costs in the use of all air-operated automatic instruments, tools and machines, paint spraying, sand blasting and moisture-free air cleaning.

Direct saving in the cost of cooling water saves the price of the Niagara Aero After Cooler in less than two years. Water saving also means less expense for piping, pumping, water treatment and water disposal, or you get the use of water elsewhere in your plant where it may be badly needed.

Niagara Aero After Cooler assures all these benefits because it cools compressed air or gas below the temperature of the surrounding atmosphere; there can be no further condensation in your air lines. It condenses the moisture by passing the air thru a coil on the surface of which water is evaporated, transferring the heat to the atmosphere. It is installed outdoors, protected from freezing in winter, proven in service on the largest plant utility air systems.

Write for complete information; ask for Bulletin No. 130

NIAGARA BLOWER COMPANY

Over 35 Years of Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave.

New York 17, N. Y.

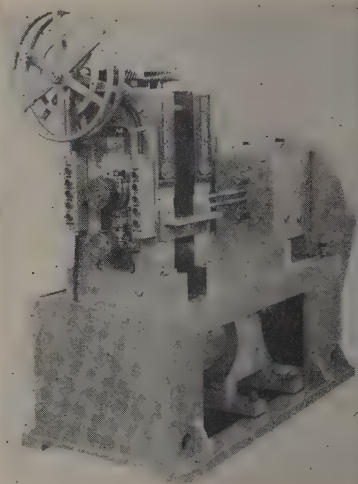
District Engineers in Principal Cities

NEW PRODUCTS and equipment

proved; torque does not fade as heat increases. Write: Dept. E, Rockford Clutch Division, Borg-Warner Corp., 1301 18th Ave., Rockford, Ill. Phone: 2-0621

Laboratory Rolling Mill

A unique drive on this combination rolling mill permits: Two-high operation; 4-high operation with back-up rolls driven; and 4-high operation with work rolls driven.



By varying the drive and the number of rolls used, the mill operates efficiently over a complete range of reductions—from breakdown rolling to the thinnest gage practical. Write: Fenn Mfg. Co., 122 Fenn Rd., Newington, Conn. Phone: Mohawk 6-2471

Photoelectric Analyzer

Chemical processes involving liquids, vapors or gases are automatically analyzed, recorded and controlled by the analyzer.

Periodically, the analyzer checks and resets itself to compensate for any smudge accumulation on cell windows or other source of error.

The instrument can record gas or vapor in air down to a few parts per billion. It can be used to give an automatic warning when noxious vapors are in the air, or as a system leak detector. Write: Manufacturers Engineering & Equipment Corp., Hatboro, Pa.



**One buyer
tells another...**

**"You'll enjoy doing business
with Lamson & Sessions"**

Did you ever stop to wonder why you patronize a particular store, restaurant or barber shop in preference to all others?

Perhaps it is habit; or maybe convenience. But chances are the main reason is because you *like* the people who serve you. It's a pleasure to do business with them.

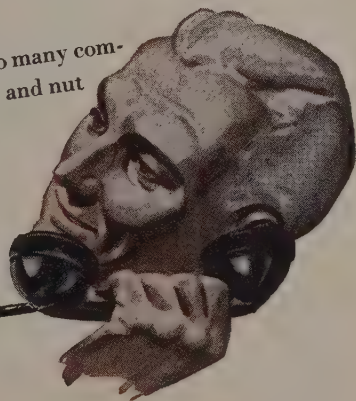
Just out of curiosity we asked several of our customers of long standing the reasons behind their year after year loyalty to Lamson & Sessions.

Of course, we received a variety of answers, but the reason that cropped up most frequently was: "Because we *enjoy* doing business with you."

Naturally that made us feel pretty good. Our people *do* try to give every customer an extra measure of attention over and above the requirements of common courtesy.

All else being equal, perhaps that's why year after year, so many companies prefer to call on Lamson & Sessions for all their bolt and nut requirements.

You, too, can enjoy this kind of business relationship.



YOU GET MORE WHEN YOU BUY FROM ...

The LAMSON & SESSIONS Co.

1971 West 85TH St. • Cleveland 2, Ohio

CLEVELAND AND KENT, OHIO • BIRMINGHAM • CHICAGO



NEW Literature

Write directly to the company for a copy

Galvanizing and Tinning

Kettles, large and small, for galvanizing and tinning are illustrated—12 pages. Steel Plate Fabricating Division, Columbiana Boiler Co., 200 W. Railroad St., Columbiana, O.

Shell Molding

Machines for preparing shell molding sand and making shells are described. Beardsley & Piper Division, Pettibone Mulliken Corp., 2424 N. Cicero Ave., Chicago 39, Ill.

Diamond Tools

Illustrations show how smaller stones can be used—6 pages. Perat-tach Diamond Tool Co. Inc., Milford, N. H.

Heat Radiation Detectors

Temperature measurement up to 5000° F and beyond, and the equipment used, are described—catalog EN-S3, 24 pages. Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.

Radiography

The importance of supervoltage radiography as an inspection and quality control tool is discussed—bulletin R, 25 pages. High Voltage Engineering Corp., 7 University Rd., Cambridge 38, Mass.

Gear Reducer

Here's the description of a universal change gear reducer—6 pages. Philadelphia Gear Works Inc., Erie Ave. & G St., Philadelphia 34, Pa.

Thickeners, Clarifiers, Agitators

Here is information on machines for separating solids from liquids in mining, chemical and metallurgical operations—bulletin 31-E, 16 pages. Hardinge Co. Inc., 240 Arch St., York, Pa.

Clamp Booklet

A line of clamps and handscrews are specified—20 pages. Sales Dept., Wetzler Clamp Co., 43-15 Eleventh St., Long Island City 1, N. Y.

Induction Heating

Here's information on high frequency heating for heat treating, joining and hot forming. Charts give current penetration in steel—6 pages. Magnethermic Corp., 3990 Simon Rd., Youngstown, O.

Press Brakes

Construction details of welded steel press brakes are illustrated—bulletin 2010-H, 8 pages. Cleveland Crane & Engineering Co., 1042 E. 289th St., Wickliffe, O.

Safety Clothing

Here is a description of asbestos safety apparel—12 pages. John Manville, 22 E. 40th St., New York 16, N. Y.

Inspection

Here's how nondestructive testing can save money—8 pages. Magnaflux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill.

Stresses in Steel Bars

The influence of residual stresses in cold-finished steel bars on manufactured parts is described—bulletin 16, 32 pages. La Salle Steel Co., 1412 150th St., Hammond, Ind.

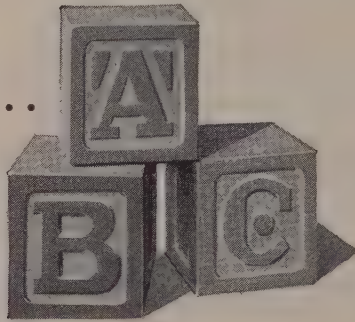
Cranes

Overhead traveling cranes (3-to-10-ton capacity) for economical handling are presented—bulletin 86, 8 pages. Whiting Corp., Harvey, Ill.

Quick-Opening Doors

Ring lock and wedge lock doors for vulcanizers, impregnators, sterilizers and ovens are illustrated—bulletin 10, 8 pages.

as basic as . . .



Designed, developed and constructed for maximum versatility, MAY-FRAN conveyor components now provide users with the ultimate of flexibility. Pre-fabricated conveyor sections can be furnished in virtually any type of hinged-steel construction to form virtually any type of hinged-steel conveyor for handling stampings, formed metal parts, forgings, automotive scrap, chips and turnings and many other miscellaneous products. Straight sections . . . concave or convex curves.

Now you can buy CUSTOMIZED conveyors in pre-fabricated STANDARD sections

MAY-FRAN ENGINEERING, INC.

6276-MF

1725 Clarkstone Road

Cleveland 12, Ohio

NEW LITERATURE

SW-553, 8 pages. Special Equipment Division, Struthers Wells Corp., Tusville, Pa.

Magnetic Conveyors

Space saving conveyors that move ferrous parts up 90-degree inclines are described—bulletin MC-250, 8 pages. Dept. 149, Homer Mfg. Co., Lima, O.

Blast Cleaning

Here's the story of how special blastless equipment solves production cleaning problems—catalog 4, 34 pages. Wheelabrator Corp., Shawaka, Ind.

Balancing Machines

Machines for the dynamic balancing of all rotating parts are covered—22 pages. Industrial Division, Far Mfg. Co., 2016 Fifth Ave., Rockland, Ill.

Welding Positioners

Specifications for all standard positioning and manipulating equipment are listed—catalog 8155, 28 pages. Indjiris Weldment Co., 5151 North-wood Ave., St. Louis 10, Mo.

ons . . . take-up and powered end sections be furnished to meet specific needs as in to conveyor belt width, physical ations as well as required volume and load cities.

installed, a MAY-FRAN conveyor can be assembled and re-assembled in another location . . . quickly, easily and with minimum down-time. In addition, conveyors can be lengthened, shortened or modified in any way at minimum cost.

MAY-FRAN . . . a name long recognized in the materials handling field . . . is first again with standardized components for your customized installation.

Power Distribution

Here is a planning guide for institutions and office buildings—bulletin GEA-6344, 20 pages. Section 680-1, General Electric Co., Schenectady 5, N. Y.

Surface Active Agents

Agents active in mild acid and alkaline solutions for cleaning and wetting uses are covered—8 pages. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Ball Bearings

Here is the latest information on bearing screws and splines—32 pages. Saginaw Steering Gear Division, General Motors Corp., Saginaw, Mich.

Carbide Tools

Helpful technical information on carbide drills and cutting tools is given—64 pages. Dept. CNR, Union Twist Drill Co., Athol, Mass.

Double-Disc Grinder

A precision grinder for generating parallel and flat surfaces on small parts is described—bulletin 2V-55, 8 pages. Gardner Machine Co., Beloit, Wis.

Power Sawing Handbook

Summary of cutoff methods includes information on costs—108 pages. DoAll Co., Des Plaines, Ill.

Inclinable Presses

Double crank presses up to 161 tons are described—catalog 3, 12 pages. E. W. Bliss Co., 1375 Raff Rd. S.W., Canton, O.

Metallizing

Sprayed metal coatings and their uses are covered—bulletin 120, 6 pages. Metallizing Engineering Co. Inc., 1011 Prospect Ave., Westbury, Long Island, N. Y.

Corrosion Control

Case histories tell how to stop galvanic corrosion of metals in contact with earth or water—bulletin 4078-HC, 12 pages. Harco Corp., 16981 Broadway, Cleveland, O.

Induction Heating

Heat treating of shafts, axles, pinions, gears, etc., by a general-purpose equipment for scanning or single-shot heating is described—bulletin 85-843. Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30, Pa.

The advertisement features a large, detailed illustration of a MAY-FRAN conveyor system, showing a long, inclined belt conveyor with a series of rollers. To the right of the main conveyor, there is a smaller inset showing a person operating a control panel. Below the main conveyor, there are five smaller diagrams labeled A through E, each showing a different component or assembly of the conveyor system. Diagram A shows a side view of a component, B shows a top view, C shows a side view of a different component, D shows a top view of a different component, and E shows a side view of a third component. The text 'Write today for complete information.' is located at the bottom right of the advertisement.



1. Rough cast bars require extensive machining before reaching usable bronze.

2. Johnson Universal Bronze Bars are completely machined inside, outside and on the ends. There's no waste.

Why pay for bronze you can't use?

That's exactly what happens when you buy rough cast bronze bars of uncertain chemical analysis that require cutting away as much as 25% of the metal inside and outside before you reach usable bronze.

Johnson *guaranteed quality* Universal Bronze Bars in over 400 standard sizes made of Johnson alloy No. 72 are *completely machined*, save you time and money because they are ready to finish into bearings, washers, thrust plates, gears, pinions, guides, rollers, sheaves, trolley wheels and other parts for your original equipment and maintenance.

Cored bars are available from stock in 354 size combinations in standard lengths

of 13" with ID's ranging from $\frac{1}{2}$ " to 8", minus $\frac{1}{32}$ ". OD's range from 1" to 10", plus $\frac{1}{32}$ ". Thickness of wall stock ranges from $\frac{1}{4}$ " to $2\frac{1}{2}$ ", plus $\frac{1}{32}$ ".

The size of each bar is plainly stamped on *both ends* for your convenience. This eliminates needless handling and measuring to find the size you want.

Centering holes (see illustration) are punched on ends of each Johnson bar to save costly set-up time.

Solid (36 sizes) and hexagonal (20 sizes) bars are also available from stock.

Ask your distributor or write for catalog to Johnson Bronze Co., 550 S. Mill St., New Castle, Pa.

Johnson Bronze Company



GRAPHITED
over 175 sizes



GENERAL PURPOSE
over 900 sizes



UNIVERSAL BRONZE BARS
over 400 sizes



LEDALOYL
over 400 sizes



ELECTRIC MOTOR
over 350 sizes

Market Outlook

STEEL PRODUCTION will break the record this week.

By next Sunday (Dec. 18), more steel for ingots and castings will have been produced in the U. S. this year than in any other full year. Output by the end of this week will be 112.6 million net tons, compared with the 1953 record of 111.6 million.

117-MILLION-TON YEAR—At the rate production is continuing, output for 1955 will total 117 million net tons. Fourth-quarter output is shaping up toward 31.2 million tons, highest rate of the year. A full year at that pace would yield 124.8 million tons.

Output in the week ended Dec. 11 was at 99 per cent of capacity. The preceding week's rate was 100.

SCRAP SETS RECORD—Records are being set, too, by prices of scrap, a steelmaking material. An all-time high of \$48.83 a gross ton was reached by STEEL's price composite on steelmaking scrap in the week ended Dec. 7. A month ago, the composite was \$45.33.

The upward thrust in scrap prices stems from capacity production of steel in the U. S., strong export demand and winter's handicaps on collection and shipment of scrap.

BACK TO WORK—Need for metallics (scrap and pig iron) is reflected by the return to production of one of the oldest blast furnaces in the U. S. (Sharon Steel Corp.'s Mary furnace at Lowellville, O.) to supply pig iron.

In contrast to the recordbreaking pace of steel production, this season's shipments of Lake Superior iron ore (a raw material for the

iron and steel industry) fell below the record. Shipments totaled 87.5 million gross tons. In 1953, the previous record year of steel production, Lake Superior ore shipments totaled 95.8 million gross tons. The difference is more than being made up by imports, which this year will total around 21.5 million tons.

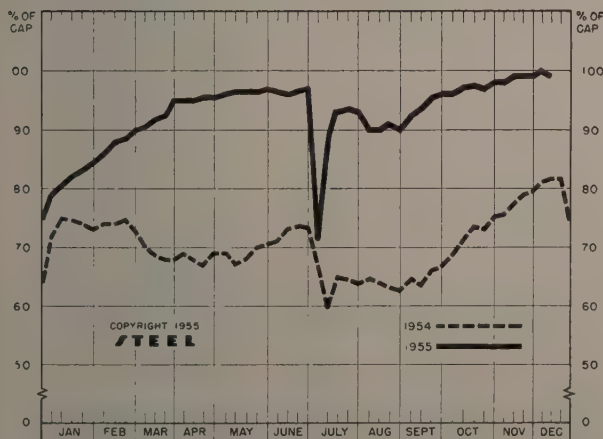
STEEL PRICES RISE—Not only do scrap prices continue their upward trend, but so do steel prices. Price extras on hot-rolled and cold-rolled carbon sheets were revised, most of the changes being upward \$1 to \$4 a ton. Warehouses are beginning to alter their prices to reflect scattered price changes (mostly upward) by mills. Fabricators of structural steel are raising their quotes to protect themselves against possible higher prices of plain material. Fabricated structural steel prices are \$25 to \$30 a ton higher than they were at midyear. A producer of electric-furnace silvery pig iron raised its price \$5.50 a gross ton, the new price being \$91.

RAW MATERIALS UP—Adding upward pressure to steel prices are raw material costs. Manganese ore went up and so did chrome ore from South Africa's Transvaal.

Steel price changes in the latest week do not affect STEEL's price composite on finished steel; it remains at \$128.14 a net ton.

BUYING CONFIDENTLY—Demand for steel is unabated. Everyone is confident of a strong first half for 1956 and is ordering steel accordingly. The high rate of activity is prompting railroads to order rails for laying next summer. The New York Central ordered 38,800 tons. It will use 40,000 tons in 1956.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Dec. 11	Change	Same Week 1954	1953
Pittsburgh	102.5	+ 3.5*	78	89
Chicago	99	+ 1.5*	90.5	96
Mid-Atlantic	99	0	74	87
Youngstown	100	0	86	88
Wheeling	100	- 2	96	83
Cleveland	98.5	+ 2.5	96	86
Buffalo	105	+ 25	100	100
Birmingham	94.5	+ 0.5	65.5	96.5
New England	89	+ 1	67	80
Cincinnati	91.5	- 1	68	71
St. Louis	103.5	+ 2	80	83.5
Detroit	99	- 1.5	74	97.5
Western	103	0	83	90
National Rate	99	- 1	81.5	85

INGOT PRODUCTION*

	Week Ended Dec. 11	Week Ago	Month Ago	Year Ago
INDEX	148.4†	146.7	149.7	121.9
(1947-1949=100)				
NET TONS	2,384†	2,356	2,404	1,958
(In thousands)				

*Change from preceding week's revised rate.
†Estimated. ‡Amer. Iron & Steel Institute.
Weekly capacity (net tons): 2,413 278 in 1955;
2,384,549 in 1954; 2,254,459 in 1953.

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Dec. 6 1955	Nov. 29 1955	Month Ago	Nov. Average
(1947-1949=100)	154.6	154.6	154.5	154.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Dec. 6

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parenthesis. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1 ..	\$4.800	Sheets, Electrical	\$10.192
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	8.043
Tie Plates	5.625	Strip, C.R., Stainless, 403	
Axles, Railway	8.000	(lb)	0.444
Wheels, Freight Car, 33		Strip, H.R., Carbon	5.406
in. (per wheel)	52.50	Pipe, Black, Buttweld (100	
Plates, Carbon	4.950	ft)	16.366
Structural Shapes	4.867	Pipe, Galv., Buttweld (100	
Bars, Tool Steel, Carbon		ft)	19.971
(lb)	0.460	Pipe, Line (100 ft)	158.925
Bars, Tool Steel Alloy, Oil		Casing, Oil Well, Carbon	
Hardening Die (lb)	0.560	(100 ft)	165.120
Bars, Tool Steel, H.R.,		Casing, Oil Well, Alloy	
Alloy, High Speed W		(100 ft)	244.670
6.75, Cr 4.5, V 2.1, Mo		Tubes, Boiler (100 ft) ..	39.470
5.5, C 0.60 (lb)	1.185	Tubing, Mechanical, Carbon	
Bars, Tool Steel, H.R.,		(lb)	20.980
Alloy, High Speed W-18,		Tubing, Mechanical, Stain-	
Cr 4, V 1 (lb)	1.680	less, 304 (100 ft)	178.897
Bars, H.R., Alloy	9.375	Tin Plate, Hot-dipped, 1.25	
Bars, H.R., Stainless, 303		lb	8.933
(lb)	0.450	Tin Plate, Electrolytic,	
Bars, H.R., Carbon	5.350	0.25 lb	7.633
Bars, Reinforcing	5.313	Black Plate, Canmaking	
Bars, C.F., Carbon	8.680	Quality	6.733
Bars, C.F., Alloy	12.175	Wire, Drawn, Carbon ..	8.575
Bars, C.F., Stainless, 302		Wire, Drawn, Stainless	
(lb)	0.468	430 (lb)	0.578
Sheets, H.R., Carbon	5.145	Bale ties (bundle)	6.473
Sheets, C.R., Carbon	6.229	Nails, Wire, 8d Common.	8.618
Sheets, Galvanized	7.690	Wire, Barbed (80-rod spool)	7.847
Sheets, C.R., Stainless,		Woven Wire Fence (20-rod	
302 (lb)	0.588	roll)	18.635

STEEL's FINISHED STEEL PRICE INDEX*

	Dec. 7 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)....	208.90	208.90	208.90	194.53	167.67
Index in cents per lb	5.659	5.659	5.659	5.270	4.545

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	\$128.14	\$128.14	\$128.14	\$117.95	\$103.50
No. 2 Fdry, Pig Iron, GT ..	58.99	58.99	58.99	56.54	52.54
Basic Pig Iron, GT	58.49	58.49	58.49	56.04	52.04
Malleable Pig Iron, GT ..	59.77	59.77	59.77	57.27	53.27
Steelmaking Scrap, GT	48.83	47.00	45.33	32.58	45.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Dec. 7 1955	Week Ago	Month Ago	Year Ago	5 Yrs.
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.30	
Bars, H.R., Chicago	4.65	4.65	4.65	4.30	
Bars, H.R., deld. Philadelphia	4.90	4.90	4.90	4.55	
Bars, C.F., Pittsburgh	5.90	5.90	5.90	5.40	
Shapes, Std., Pittsburgh	4.60	4.60	4.60	4.25	
Shapes, Std., Chicago	4.60	4.60	4.60	4.25	
Shapes, deld., Philadelphia ..	4.88	4.88	4.88	4.53	
Plates, Pittsburgh	4.50	4.50	4.50	4.225	
Plates, Chicago	4.50	4.50	4.50	4.225	
Plates, Coatesville, Pa.	4.80	4.80	4.80	4.225	
Plates, Sparrows Point, Md. ..	4.50	4.50	4.50	4.225	
Plates, Claymont, Del.	4.80	4.80	4.80	4.225	
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.05 3.60	
Sheets, H.R., Chicago	4.325	4.325	4.325	4.05	
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	4.95	
Sheets, C.R., Chicago	5.325	5.325	5.325	4.95	
Sheets, C.R., Detroit ..	5.325-5.425	5.325-5.425	5.325-5.425	5.10	
Sheets, Galv., Pittsburgh	5.85	5.85	5.85	5.45	
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.05 3.75	
Strip, H.R., Chicago	4.325	4.325	4.325	4.05	
Strip, C.F., Pittsburgh	6.25	6.25	6.25	5.75 4.65	
Strip, C.R., Chicago	6.35	6.35	6.35	5.85 5.40	
Strip, C.R., Detroit	6.35	6.35	6.35	5.90 4.35	
Wire, Basic, Pittsburgh	6.25	6.25	6.25	5.75 4.85	
Nails, Wire, Pittsburgh	7.60	7.60	7.60	6.85 5.90	
Tin plate (1.50 lb), box, Pitts.	\$9.45	\$9.45	\$9.45	\$9.05	\$7

SEMFINISHED STEEL

Billets, Forging, Pitts. (NT)	\$84.50	\$84.50	\$84.50	\$78.00	\$66
Wire rods, $\frac{1}{2}$ - $\frac{5}{8}$ " Pitts.	5.025	5.025	5.025	4.675	4.10-

PIG IRON, Gross Ton

Bessemer, Pitts.	\$59.50	\$59.50	\$59.50	\$57.00	\$53
Basic, Valley	58.50	58.50	58.50	56.00	52
Basic, deld. Phila.	62.16	62.16	62.16	59.66	56
No. 2 Fdry, Pitts.	59.00	59.00	59.00	56.50	52
No. 2 Fdry, Chicago	59.00	59.00	59.00	56.50	52
No. 2 Fdry, Valley	59.00	59.00	59.00	56.50	52
No. 2 Fdry, deld. Phila.	62.66	62.66	62.66	55.16	56
No. 2 Fdry, Birm.	55.00	55.00	55.00	52.88	48
No. 2 Fdry (Birm.) deld. Cin. ..	62.70	62.70	62.70	60.58	55
Malleable, Valley	59.00	59.00	59.00	56.50	52
Malleable, Chicago	59.00	59.00	59.00	56.50	52
Ferromanganese, Duquesne.	190.00†	190.00†	190.00†	190.00†	188

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	\$47.50	\$46.50	\$44.50	\$32.50	\$46
No. 1 Heavy Melt, E. Pa.	50.00	48.00	47.00	32.25	45
No. 1 Heavy Melt, Chicago	49.00	46.50	44.50	33.00	45
No. 1 Heavy Melt, Valley	52.50	52.50	48.00	34.50	46
No. 1 Heavy Melt, Cleve.	49.50	49.50	45.50	32.50	45
No. 1 Heavy Melt, Buffalo.	43.50	43.50	43.50	30.50	41
Rails, Rerolling, Chicago	73.50	69.50	65.50	52.50	65
No. 1 Cast, Chicago	49.50	49.50	47.50	39.50	62

COKE, Net Ton

Beehive, Furn, Connslvl.	\$13.625	\$13.625	\$13.625	\$13.75	\$14
Beehive, Fdry, Connslvl.	16.50	16.50	16.50	16.75	16
Oven, Fdry, Chicago	25.75	25.75	25.75	24.50	21

Daily Nonferrous Price Record

	Price Dec. 7	Last Change	Previous Price	Nov. Avg.	Oct. Avg.	Dec. 1954 Avg.	Quotations in cents per pound based on nearest production point.
Copper	43.00-48.00	Nov. 30, 1955	43.00-47.00	44.420	44.594	30.000	COPPER, deld. Conn. Valley; LEAD, com grade, deld. St. Louis; ZINC, prime western, E. St. Louis; 75% prime, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size refinery, unpacked; ALUMINUM, prim ingots, 99 + %, deld.; MAGNESIUM, 99.8%, Freeport, Tex.
Lead	15.30	Sept. 26, 1955	14.80	15.300	15.300	14.800	
Zinc	13.00	Oct. 21, 1955	13.00-13.50	13.000	13.020	11.500	
Tin	105.375	Dec. 7, 1955	104.25	97.825	96.230	88.649	
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	64.500	
Aluminum ..	24.40	Aug. 8, 1955	23.20-24.40	24.400	24.400	22.200	
Magnesium ..	32.50	Aug. 16, 1955	28.50	32.500	32.500	27.000	

What You Can Use the Markets Section for:

- A source of price information. Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- A directory of producing points. Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- A source of price data for making your own comparisons. Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- A source of information on market trends. Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- Reports on iron and steel production, and materials and product shipments.

USS Gerrard ties ANYTHING you've ever seen



The 50-pound tuyeres are palletized right in the kiln. They are stacked 42 to a pallet, and bound with two loops of $\frac{3}{4}$ " x .035" USS Gerrard Flat Steel Strapping.

Work lift truck drives right into the kiln, picks up the pallet and takes it to railroad car or to the warehouse. No manual handling is necessary.

"USS Gerrard Steel Strapping has saved money in loading, storage, breakage and man-hours not only for us but for our customers as well"

Says Climax Fire Brick Co. • Climax, Pennsylvania

In 1949 the Climax Fire Brick Company turned to USS Gerrard for the best method of handling and shipping odd-size fire bricks, known as tuyeres. Here are the results:

By using USS Gerrard Flat Steel Strapping they reduced their shipping damage to *less than 1%*!

Since they can safely stack the Gerrard-palletized tuyeres much higher, they have *increased their storage space by 33%*!

- Loading and moving the tuyeres by hand used to require 8 hours to fill a normal freight car with 2200 units. Using the Gerrard system, it now takes only 2 hours—a *savings of 75% in man-hours alone!*

The tuyeres are used exclusively in the Bessemer Furnace. When fitted together in the furnace, they form a series of continuous holes through which highly compressed air is forced into the molten steel for the

purpose of blowing out impurities. Climax Company produces 60% of the nation's tuyere requirements.

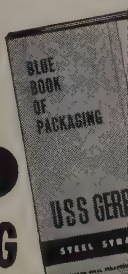
It's time for you to try USS Gerrard Steel Strapping—both Round and Flat. Whatever your packaging-tying problem might be, our engineers can help you find the safest, most economical solution. Contact us at your convenience. Meantime, send for your free copy of the new Gerrard Blue Book of Packaging.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION

General Offices: Chicago, Illinois

USS GERRARD
Round and Flat
STEEL STRAPPING

UNITED STATES STEEL



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Please send me, free of charge, the new 36-page GERRARD Blue Book of Packaging.

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Company

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City State

Nonferrous Metals

Aluminum industry receives another vote of confidence. After making thorough market survey, Kaiser announces plans to expand its capacity by 50 per cent

Nonferrous Metal Prices, Pages 150 & 151

ALUMINUM has the spotlight. Reasons: Expansion, a reduction in Canadian production and progress made in consumption.

Kaiser Aluminum & Chemical Corp. receives top billing with its expansion program. Its annual capacity will be upped 50 per cent, to 654,000 tons.

What, Where?—Leading the parade will be a new, 220,000-ton reduction plant (cost: \$120 million) at Ravenswood, W. Va. Kaiser already has a \$96-million sheet and foil mill under construction at Ravenswood. A \$50-million alumina plant (500,000-ton capacity) will be built at Gramercy, La., and some \$100 million is being earmarked for increased chemical and mill fabricating facilities.

Two things are apparent: 1. Coal is coming back into its own. 2. Kaiser has beaten St. Joe, Olin-Mathieson and Revere to the Ohio Valley.

Coal will help generate the power supplied by the Ohio Power Co., a subsidiary of American Gas & Electric Co. Philip Sporn, American's president, points out that the coal picture is particularly bright. Reserves are ample and are of high grade. A large portion of the coal is near navigable water routes.

In the Center—Both companies are quick to report that the future of this area is even more important than the present. With this expansion, they explain, will come the development of a great many industries dependent on the raw and semifinished materials produced at the new aluminum center. One Kaiser official states: "Another reason for selecting Ravenswood for the reduction plant is the fact that 70 per cent of the market for aluminum is within a 500-mile radius of this small community."

The power contract provides for the availability of 450,000 kw for 40 years. This means that American Gas & Electric is guaranteeing that as each new facility is built, it will have sufficient capacity ready to meet the power requirements. Ground will be broken in April. Initial production is scheduled for July, 1957. When completed, Kaiser will become the second largest aluminum producer. It is third now.

Kaiser's decision to expand im-

mediately is based on a nine-month market survey it made. It showed: There will be a demand for some 4 million tons of the lightweight

STEEL's Metal Price Averages for Nov., 1955

(Cents per lb)

Electrolytic Copper, deld.	
Connecticut	44.420
Lead, St. Louis	15.300
Prime Western Zinc,	
E. St. Louis, Ill.	13.000
Straits Tin, New York ..	97.825
Primary Aluminum	
Ingot, deld.	24.400
Magnesium, Freeport,	
Tex.	32.500
Nickel, f.o.b. refinery ..	64.500

metal by 1965. This would about double present consumption.

Nature's Trick—While Kaiser was announcing its expansion, Aluminum Ltd. was admitting that the corporation's chief subsidiary, Aluminum Co. of Canada, is being forced to curtail its aluminum production during the winter months. Reason: A summer drouth, the worst on record, has reduced the amount of water available for power. Until spring thaws come, Alcan will lose about 5 per cent of its production. The corporation's rated capacity for this year is 650,000 tons. It will miss reaching capacity by about 7 per cent because of the drouth (Quebec area) and an accidental power interruption at Kitimat during the year. All told, some 35,000 tons will be lost during the next few months.

There is one bright spot. Next year will bring in 82,000 tons of new capacity, which should provide at least 35,000 tons of new production during the second half. The exact increase will hinge on how quickly additional capacity can be put into operation during 1956.

Alcoa, Too—Appearing before industrialists at the Second Pitt Conference on business prospects, Don Wilmot, vice president, Aluminum Co. of America, noted that aluminum consumption is out-stripping the pace of U. S. industrial growth. He explains that the domestic consumption of

aluminum is well ahead of the Federal Reserve Board's index of industrial growth.

Factors pointing to success: Aluminum ingot's price of 24.4-cents per pound is only 22 per cent above 1939 levels. 2. Aluminum is free from the effects of world political and economic uncertainties. 3. It is enjoying growing acceptance on its own merit.

"We in the aluminum business says Mr. Wilmot, "are pleased that our metal has become so popular. However, we recognize that our invasion of markets will not always be successful, nor will we retain some of our present markets where competitive materials go all out to win back lost markets."

Copper Strike Collapses

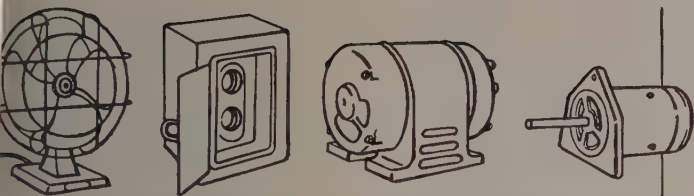
The strike clouds in Chile threatened, then subsided, early last week. But strike or no strike, there is little hope for an improved balance between copper supply and demand until the second quarter of 1956.

Industry leaders feel that the price of the primary red metal will remain constant. The custom smelters' price may remain at about 48 cents a pound. It is almost certain that it will not drop until after the first of the year.

With LIFO going out as of Dec. 31, there are a few experts who think that this might make some extra copper available. Others quickly point out that all companies still will be looking for copper to rebuild depleted inventories. Most companies are getting only enough to meet current production needs.

Silver Prices Rebound

Silver prices, after having a steady year, are reflecting a seasonal trend. The arts users of the precious metal now have their products on the Christmas counters. However, when the price dropped to 90 cents a troy ounce last week, it took all domestic silver off the market as the U. S. mint is paying 90½-cents for the metal. With the price drop, West Coast producers were quick to take advantage of being able to ship to San Francisco or Denver mints rather than to the East Coast. The 90-cent price was short lived. There was still enough civilian demand to send the price back to about 90¼-cents per ounce.



FROM ELECTRIC FURNACE TO ELECTRIC INDUSTRY

Newport Steel



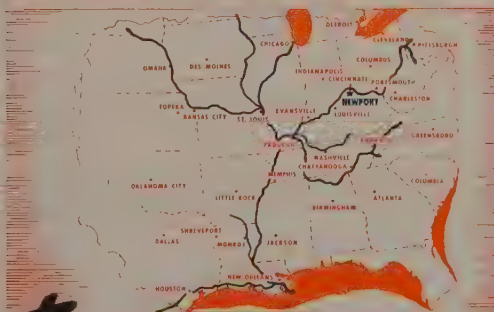
Manufacturers of electrical equipment represent another of the many industries which make Newport Steel their regular source of supply. The confidence of these outstanding manufacturers is based upon Newport's ability to deliver qualities and quantities of steel to precise specification. For Newport has the facilities, personnel, experience and strategic location to meet the most exacting demands for the products listed at the right.

PRODUCTS OF NEWPORT STEEL

- Cold-Rolled Sheets
- Hot-Rolled Steel in Coil
- Hot-Rolled Pickled Steel in Coil
- Hot-Rolled Sheets
- Hot-Rolled Pickled Sheets
- Galvanized Sheets
- Galvannealed Sheets
- Colorbond Sheets
- Electrical Sheets
- Alloy Sheets and Plates
- Electric Weld Line Pipe
- Roofing and Siding
- Eave Trough and Conductor Pipe
- Culverts

ECONOMICAL WATERRAIL-TRUCK DELIVERY

Newport Steel is ideally situated on the Mississippi-Ohio River system and the great Cincinnati rail-truck hub. New barge facilities, 7 major railroads and 143 motor carriers enable Newport to give economical, dependable delivery to the entire area of the Middle West and South.



Newport Steel
CORPORATION



NEWPORT, KENTUCKY

OUR CONFIDENCE IS JUSTIFIED WHERE THIS FLAG FLIES

A SUBSIDIARY OF MERRITT-CHAPMAN & SCOTT CORPORATION

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 24.40, pigs 22.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 26.20; No. 43, 5% Si, 26.00; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 28.20; No. 195, 4.5% Cu, 0.8% Si, 27.60; No. 214, 3.8% Mg, 27.80; No. 356, 7% Si, 0.3% Mg, 26.20.

Antimony: R.M.M. brand, 99.5%, 33.00, Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, \$71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, \$72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, \$43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: \$2.25 per lb, ton lots.

Cadmium: Sticks and bars, \$1.70 per lb, deld.

Cobalt: 97-99%, \$2.60 per lb for 550-lb keg; \$2.62 per lb for 100-lb case; \$2.67 per lb under 100 lb.

Columbium: Powder, \$119.20 per lb, nom.

Copper: Electrolytic, 43.00 deld. Conn. Valley; 43.00 deld. Midwest; custom smelters, 48.00 deld.; Lake, 43.00 deld.; Fire refined, 42.75 deld.

Germanium: 99.9%, \$295 per lb, nom.

Gold: U. S. Treasury, \$35 per oz.

Indium: 99.9%, \$2.25 per troy oz.

Iridium: \$100-\$120 nom, per troy oz.

Lead: Common, 15.30, chemical, 15.40, cor-rod, 15.40, St. Louis, New York basis, add 0.20.

Lithium: 99%+, cups, or ingot, \$11.50; rod, \$13.50; shot or wire, \$14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8% self-palletizing pig, 32.50; notched ingot, 32.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.00 for both pig and ingot. Sticks 1.3 in. diameter, 53.00, 100 to 499 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, G, H and R, 36.00; alloy M, 38.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, \$280-\$285 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced, \$3-\$3.35 per lb; pressed ingot, \$4.06 per lb; sintered ingot, \$5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 0.92.

Osmium: \$80-\$100, nom, per troy oz.

Palladium: \$22-\$24 per troy oz.

Platinum: \$97-\$117 per troy oz from refineries.

Radium: \$16-\$21.55 per mg radium content, depending on quality.

Ruthenium: \$45-\$55 per troy oz.

Selenium: 99.5%, \$9-\$10 per lb.

Silver: Open market, 90.50 per troy oz.

Sodium: 16.50, c.i., 17.00, l.c.i.

Tantalum: Sheet, rod, \$68.70 per lb; powder, \$56.63 per lb.

Tellurium: \$1.75 per lb.

Thallium: \$12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 105.375.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), \$3.45, grade A-2 (0.5% Fe max), \$3.15 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, \$4.50 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced \$5.00. Treated ingots, \$6.70.

Zinc: Prime Western, 13.00; brass special, 13.25; intermediate, 13.50, East St. Louis, freight allowed over 0.50 per pound. High grade, 14.35; special high grade 14.75, deld. Diecasting alloy ingot No. 3, 17.50; No. 2, 18.50; No. 5, 18.00, deld.

Zirconium: Ingots, commercial grade, \$14.40 per lb; low-hafnium reactor grade, \$23.07. Sponge, \$10 per lb. Powder electronics grade, \$15 per lb; flash grade, \$11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 32.00-34.00; No. 12 foundry alloy (No. 2 grade) 31.00-31.25; 5% silicon alloy, 0.60 Cu max, 32.50-33.25; 13 alloy, 0.60 Cu max, 32.50-33.25; 195 alloy, 32.50-33.25; 108 alloy, 31.00. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 31.00-32.00; grade 2, 30.00-31.00; grade 3, 29.00-30.00; grade 4, 28.00-29.50.

Brass Ingot: Red brass No. 115, 42.00; tin bronze No. 225, 56.00; No. 245, 48.75; high-leaded tin bronze No. 305, 45.75; No. 1 yellow No. 405, 33.25; manganese bronze No. 421, 37.75.

Magnesium Alloy Ingot: AZ63A, 34.00; AZ91B, 34.00; AZ91C, 34.00; AZ92A, 34.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, \$1.84; rod, bar, wire, \$1.81.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 48.35; 30,000-lb lots 48.88; l.c.i., 48.98. Weatherproof, 100,000-lb lots, 46.03; 30,000-lb lots, 46.28; l.c.i., 46.78. Magnetic wire deld., 15,000 lb or more, 55.52; l.c.i., 56.27.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, \$21 per cwt; pipe, full coils, \$21 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, \$13.10-\$13.60; sheared mill plate, \$10.50-\$12.00; strip, \$13.10-\$13.60; wire, \$9.50-\$11.50; forging billets, \$7.90-\$8.15; hot-rolled and forged bars, \$7.90-\$8.15.

ZINC

(Prices per lb, c.i., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 20.50; plates 19.50-22.25.

ZIRCONIUM

Plate, \$22; H. R. strip, \$19; C. R. trip, \$29; forged or H.R. bars, \$17; wire, 0.015 in., 1.00c per linear foot.

NICKEL MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	102	83	99
Strip, C.R.	102	92	125
Plate, H.R.	97	87	95
Rod, Shapes, H.R. ...	87	74	93
Seamless Tubes	122	110	153
Shot, Blocks ....	...	71	...

ALUMINUM

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or —Round— —Hexagonal—
across flats 2011-T3 2017-T4 2011-T3 2017-T4

Drawn				
0.125	67.9	66.4	...	...
0.156-0.172	57.5	55.9	...	...
0.188	57.5	55.9	...	...
0.219-0.234	54.5	52.9	...	71.7
0.250-0.281	54.5	52.9	...	68.4
0.313	54.5	52.9	...	65.2

Cold-finished				
0.375-0.547	53.4	51.4	63.7	61.3
0.563-0.688	53.4	51.4	60.6	57.5
0.750-1.000	52.1	50.1	55.4	54.2
1.063	52.1	50.1	...	52.3
1.125-1.500	50.1	48.2	53.6	52.3

Rolled				
1.563	48.8	46.9	...	...
1.625-2.000	48.2	46.2	...	50.5
2.125-2.500	47.0	45.0	...	...
2.563-3.375	45.6	43.6	...	...

BRASS MILL PRICES

	Sheet, Strip, Plate	Rod	Wire	Seamless Tube
Copper	63.13b	60.36c	...	63.32
Yellow Brass	52.27	42.41d	52.81	55.18
Red Brass, 85%	58.09	58.03	58.63	60.90
Low Brass, 80%	56.55	56.49	57.09	59.36
Naval Brass	55.63	55.63	56.79	58.79
Com. Bronze, 90%	60.15	60.12	60.72	62.74
Nickel Silver, 10%	66.00	65.33g	68.33	...
Phos. Bronze, A, 5%	50.99	51.49	52.67	...
Silicon Bronze	66.54	65.73	66.58	68.68e
Manganese Bronze	59.37	53.38	63.82	...
Muntz Metal	53.74	49.55	...	...

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

ALUMINUM

Sheet and Circles: 1100 and 3003 mill fin (30,000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Circles*	Coiled Sheet	Coiled Circles
0.249-0.136	37.5	42.3	...	...
0.135-0.098	38.0	43.2	...	...
0.095-0.077	33.7	44.2	36.1	41
0.076-0.061	39.3	45.1	36.3	41
0.060-0.048	39.9	45.6	36.7	42
0.047-0.038	40.4	46.5	37.2	42
0.037-0.030	40.8	47.0	37.6	43
0.029-0.024	41.4	47.5	37.9	43
0.023-0.019	42.2	49.0	38.8	44
0.018-0.017	43.0	...	39.4	45
0.016-0.015	43.9	...	40.2	46
0.014	44.9	...	41.2	47
0.013-0.012	46.1	...	41.9	48
0.011	47.1	...	43.1	50
0.010-0.0095	48.4	...	44.3	52
0.009-0.0085	49.7	...	45.8	54
0.008-0.0075	51.3	...	47.0	56
0.007	52.8	...	48.5	58
0.006	54.4	...	49.9	63

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	36.5	40.8
5050-F	37.6	41.9
3004-F	38.6	43.8
5052-F	39.9	45.2
6061-T6	41.1	46.0
2024-T4*	43.6	49.9
7075-T6*	51.4	58.5

*24-48 in. widths or diam, 72-180 lengths

ALUMINUM

Forging Stock: Round, Class 1, 39.10-50.1 in. specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 43.00-56.20 in random lengths, 0.375-4 in. thick widths 0.750-10 in.

Pipe: ASA. Schedule 40, alloy 6063-T6, 20 lengths, plain ends, 90,000-lb base, per 100 ft

Nom. Pipe Size (in.)	Nom. Pipe Size (in.)	
3/4	16.85	2
1	26.50	4
1 1/4	35.85	6
1 1/2	42.90	8

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032 in. 99c; 0.064 in., 78.00c; 0.125 in., 63.50c, 30,000 lb and over, f.o.b. mill.

Plate: AZ31, 61.00c, 30,000 lb or more, 0.25 in. and over, widths 24-60 in., lengths 72-144 in.; tread plate, 64.00c, 30,000 lb or more, 1/4 in. thick, widths 24-60 in., lengths 60-192 in. tooling plate 66.00c, 30,000 lb or more, 0.25 in. 3,000 in., widths 60-72 in., lengths 72-180 in.

Extrusions: AZ31 commercial grade, rectangles, 1/4 x 2 in., 64.70c; 1 x 4 in., 69.50c. Rod 1 in., 61.50c; 2 in., 59.00c. Tubing, 1 in. O.D. x 0.065 in., 82.50c. Angles, 1 x 1 x 1/4 in., 68.40c; 2 x 2 x 1/4 in., 62.50c. Channels, 1 in., 63.40c. I-beams, 5 in., 62.70c.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 19.50-20.00; old sheets 16.50-17.25; borings and turnings, 11.00-11.50; crankcases, 16.50-17.25; industrial castings 16.50-17.25.

Copper and Brass: No. 1 heavy copper and wire 39.00-40.00; No. 2 heavy copper and wire, 36.00-37.00; light copper, 34.00-34.50. No. 1 composition red brass, 30.00-31.00; No. 1 composition turnings, 28.50-29.50; yellow

SCRAP ALLOWANCES

	Clean Heavy	Rod Ends	Clean Turnings
Aluminum	39.000	39.000	38.250
Brass	28.875	28.625	26.750
Copper	34.250	34.000	33.500
Low Brass	32.750	32.500	32.000
Naval Brass	32.750	32.500	32.000
Com. Bronze	35.750	35.500	35.000
Nickel Silver	32.500	32.250	18.250
Phos. Bronze	39.250	39.000	38.000
Silicon Bronze	37.875	37.625	37.375
Manganese Bronze	27.000	26.750	26.000
Muntz Metal	27.000	26.750	26.250

brass turnings, 16.00-16.50; new brass clippings, 24.50-25.50; light brass, 16.50-17.50; heavy yellow brass, 19.50-20.50; new brass and ends, 23.50-24.00; auto radiators, un-
 treated, 23.00-24.00; cocks and faucets, 23.50-25.00; brass pipe, 23.50-25.00.

Lead: Heavy, 12.00-12.50; battery plates, 6.50-7.50; linotype and stereotype, 13.25-14.25; electrolyte, 12.00-12.75; mixed babbit, 14.50.
 Magnesium: Clippings, 18.50-19.50; clean castings, 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.

Nickel: Clippings, 54.50-65.00; old sheets, 50.00-65.00; turnings, 44.00; rods, 54.50-65.00.
 Nickel: Sheets and clips, 90.00-125.00; rolled rods, 90.00-125.00; turnings, 75.00-100.00; old ends, 90.00-125.00.

Zinc: Old zinc, 5.50-6.00; new die-cast scrap, 3.00-5.75; old die-cast scrap, 3.25-3.50.

REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)
 Aluminum: 1100 clippings, 23.50; 3003 clippings, 23.25-23.50; 6151 clippings, 23.00-23.50; 352 clippings, 23.00-23.50; 2014 clippings, 22.50-23.00; 2017 clippings, 22.50-23.00; 2024 clippings, 22.50-23.00; mixed clippings, 22.50-23.00; old sheet, 19.50-20.50; old cast, 20.50; clean old cable (free of steel), 23.50; borings and turnings, 20.50-21.50.

Eryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 54.00; light scrap, 49.00; turnings and borings, 39.00.

Copper and Brass: No. 1 heavy copper and wire, 41.00; No. 2 heavy copper and wire, 39.50; light copper, 37.25; refinery brass (60% copper) per dry copper content, 37.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)
 Copper and Brass: No. 1 heavy copper and wire, 41.00; No. 2 heavy copper and wire, 39.50; light copper, 37.25; No. 1 composition brisings, 33.00-33.75; No. 1 composition solids, 33.00-34.25; heavy yellow brass solids, 23.00; yellow brass turnings, 22.00; radiators, 26.00-27.50.

PLATING MATERIAL

F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, \$1.70 per lb.

Copper: Flat-rolled, 59.79, oval, 58.92, 5000-10,000 lb; electrodeposited, 54.28, 2000-5000 lb; cast 59.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, \$1.015; 100-499 lb, 99.50; 500-999 lb, 95.50; 1000-1999 lb, 93.50; 20,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Iron: Bar or slab, less than 200 lb, \$1.225; 200-499 lb, \$1.21; 500-999 lb, \$1.205; 1000 lb or more, \$1.20.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 20.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: \$2.15 per lb, in 100-lb drums.
 Chromic Acid: Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100 lb, 85.25; 200 lb, 84.50; 300 lb, 84.25; 400-900 lb, 85.50; 1000 lb, 81.50.

Copper Sulphate: 500-1900 lb, 17.90; 2000-5900 lb, 15.90; 6000 lb or more, 15.65.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 39.50; 10,000 lb and over, 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb, 33.25; 200 lb, 36.25; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 8.875; 16-oz bottle, 85.625; 80-oz bottle, 3.125; 100-oz bottle, 83.125; f.o.b. St. Louis, New York and Los Angeles. Effective Sept. 10, 1955.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 200 lb, 75.40; 100-200 lb, 60.90; 700-1900 lb, 58.30; 2000-9900 lb, 56.70; 10,000 lb or more, 55.50.

Tannous Chloride (anhydrous): Less than 50 lb, \$1.637; 50 lb, \$1.297; 100-300 lb, \$1.147; 400-900 lb, \$1.122; 1000-1900 lb, \$1.098; 2000-900 lb, \$1.061; 5000-19,900 lb, \$1.00; 20,000 lb or more, 94.00.

Tannous Sulphate: Less than 50 lb, \$1.333; 50 lb, \$1.033; 100-1900 lb, \$1.013; 2000 lb or more, 99.30.

Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.

AIR LIFT

for heavy materials

Crowded isles and sluggish flow of materials cost you money. So why not go over the top!

You can speed production, cut your costs with

Conco Cranes, custom designed for your specific needs.

Let us show you how. Write for a trained

Conco engineer to call and make recommendations,

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complete Conco line. Conco Cranes are backed

by 37 years of experience.

CONCO ENGINEERING WORKS

Division of H. D. CONKEY & COMPANY

70-14th Avenue, Mendota, Illinois



AFFILIATES

CONCO ENGINEERING WORKS—Domestic Heating Equipment
 CONCO BUILDING PRODUCTS, INC.—Brick, Tile, Stone



Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company. Key on page 153. Key to footnotes, Page 155.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)	
Munhall, Pa. U5	...\$65.50
INGOTS, Alloy (NT)	
Detroit R7	...\$69.00
Houston S5	...74.00
Midland, Pa. C18	...69.00
Munhall, Pa. U5	...69.00

BILLETS, BLOOMS & SLABS

Carbon, Rolling (NT)	
Alliquippa, Pa. J5	...\$68.50
Bessemer, Ala. T2	...68.50
Bridgeport, Conn. N19	...73.50
Buffalo R2	...68.50
Clairton, Pa. U5	...68.50
Ensley, Ala. T2	...68.50
Fairfield, Ala. T2	...68.50
Fontana, Calif. K1	...78.00
Gary, Ind. U5	...68.50
Johnstown, Pa. B2	...68.50
Lackawanna, N.Y. B2	...68.50
LoneStar, Tex. L6	...74.50
Munhall, Pa. U5	...68.50
Pittsburgh J5	...68.50
S. Chicago, Ill. R2, U5	...68.50
S. Duquesne, Pa. U5	...68.50
Youngstown R2	...68.50

Carbon, Forging (NT)

Alliquippa, Pa. J5	...\$84.50
Bessemer, Ala. T2	...84.50
Bridgeport, Conn. N19	...89.50
Buffalo R2	...84.50
Canton, O. R2	...86.50
Clairton, Pa. U5	...84.50
Conshohocken, Pa. A3	...89.50
Ensley, Ala. T2	...84.50
Fairfield, Ala. T2	...84.50
Fontana, Calif. K1	...92.00
Gary, Ind. U5	...84.50
Geneva, Utah C11	...84.50
Houston S5	...89.50
Johnstown, Pa. B2	...84.50
Lackawanna, N.Y. B2	...84.50
Los Angeles B3	...94.00
Midland, Pa. C18	...84.50
Munhall, Pa. U5	...84.50
Pittsburgh J5	...84.50
Seattle B3	...98.00
S. Chicago R2, U5, W14	...84.50
S. Duquesne, Pa. U5	...84.50
S. San Francisco B3	...94.00

Alloy, Forging (NT)

Bethlehem, Pa. B2	...\$96.00
Buffalo R2	...96.00
Canton, O. R2, T7	...96.00
Conshohocken, Pa. A3	...103.00
Detroit R7	...96.00
Fontana, Calif. K1	...115.00
Gary, Ind. U5	...96.00
Houston S5	...101.00
Ind. Harbor, Ind. Y	...96.00
Johnstown, Pa. B2	...96.00
Lackawanna, N.Y. B2	...96.00
Los Angeles B3	...116.00
Massillon, O. R2	...96.00
Midland, Pa. C18	...96.00
Munhall, Pa. U5	...96.00
S. Chicago R2, U5, W14	...96.00
S. Duquesne, Pa. U5	...96.00
Struthers, O. Y1	...96.00
Warren, O. C17	...96.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	...\$103.50
Canton, O. R2	...103.50
Cleveland R2	...103.50
Gary, Ind. U5	...103.50
S. Chicago R2, W14	...103.50
S. Duquesne, Pa. U5	...103.50

SKELP

Alliquippa, Pa. J5	...4.325
LoneStar, Tex. L6	...4.625
Munhall, Pa. U5	...4.225
SparrowsPoint, Md. B2	...4.225
Warren, O. R2	...4.225
Youngstown R2, U5	...4.225

WIRE RODS

AlabamaCity, Ala. R2	...5.025
Alliquippa, Pa. J5	...5.025
Alton, Ill. L1	...5.20
Buffalo B1, W12	...5.025
Cleveland A7	...5.025
Donora, Pa. A7	...5.025
Fairfield, Ala. T2	...5.025
Houston S5	...5.275
IndianaHarbor, Ind. Y1	...5.025
Johnstown, Pa. B2	...5.025
Joliet, Ill. A7	...5.025
KansasCity, Mo. S5	...5.275
Kokomo, Ind. C16	...5.125

Los Angeles B3	...5.825
Minneapolis, Colo. C10	...5.275
Monsen, Pa. P7	...5.025
N. Tonawanda, N.Y. B11	...5.025
Pittsburgh, Calif. C11	...5.675
Portsmouth P12	...5.025
Roebing, N.J. R5	...5.125
S. Chicago, Ill. R2	...5.025
SparrowsPoint, Md. B2	...5.125
Sterling, Ill. (1) N15	...5.025
Sterling, Ill. N15	...5.125
Struthers, O. Y1	...5.025
Worcester, Mass. A7	...5.325

STRUCTURALS

Carbon Steel Std. Shapes

Ala. City, Ala. R2	...4.60
Alliquippa, Pa. J5	...4.60
Bessemer, Ala. T2	...4.60
Bethlehem, Pa. B2	...4.65
Birmingham C15	...5.10
Clairton, Pa. U5	...4.60
Fairfield, Ala. T2	...4.60
Fontana, Calif. K1	...5.25
Gary, Ind. U5	...4.60
Geneva, Utah C11	...4.60
Houston S5	...4.70
Ind. Harbor, Ind. I-2	...4.60
Johnstown, Pa. B2	...4.65
KansasCity, Mo. S5	...4.70
Lackawanna, N.Y. B2	...4.65
Los Angeles B3	...5.30
Minneapolis, Colo. C10	...4.90
Munhall, Pa. U5	...4.60
Niles, Calif. P1	...4.90
Portland, Ore. O4	...5.35
Phoenixville, Pa. P4	...5.15
Seattle B3	...5.35
S. Chicago U5, W14	...4.60
S. San Francisco B3	...5.25
Torrance, Calif. C11	...5.30
Weirton, W. Va. W6	...4.60

Wide Flange

Bethlehem, Pa. B2	...4.65
Clairton, Pa. U5	...4.60
Fontana, Calif. K1	...5.40
Lackawanna, N.Y. B2	...4.65
Munhall, Pa. U5	...4.60
Phoenixville, Pa. P4	...5.15
S. Chicago, Ill. U5	...4.60

Alloy Std. Shapes

Clairton, Pa. U5	...5.65
Fontana, Calif. K1	...7.30
Gary, Ind. U5	...5.65
Houston S5	...5.75
Munhall, Pa. U5	...5.65
S. Chicago, Ill. U5	...5.65

H.S., L.A. Std. Shapes

Alliquippa, Pa. J5	...6.75
Bessemer, Ala. T2	...6.75
Bethlehem, Pa. B2	...6.80
Clairton, Pa. U5	...6.75
Fairfield, Ala. T2	...6.75
Fontana, Calif. K1	...7.40
Gary, Ind. U5	...6.75
Geneva, Utah C11	...6.75
Houston S5	...6.85
Ind. Harbor, Ind. I-2, Y1	...6.75
Johnstown, Pa. B2	...6.80
KansasCity, Mo. S5	...6.85
Lackawanna, N.Y. B2	...6.80
Los Angeles B3	...7.45
Munhall, Pa. U5	...6.75
Seattle B3	...7.50
S. Chicago, Ill. U5, W14	...6.75
S. San Francisco B3	...7.40
Struthers, O. Y1	...6.75

H.S., L.A. Wide Flange

Bethlehem, Pa. B2	...6.80
Lackawanna, N.Y. B2	...6.80
Munhall, Pa. U5	...6.75
S. Chicago, Ill. U5	...6.75

PILING

BEARING PILES

Bethlehem, Pa. B2	...4.65
Lackawanna, N.Y. B2	...4.65
Munhall, Pa. U5	...4.60
S. Chicago, Ill. U5	...4.60

STEEL SHEET PILING

Ind. Harbor, Ind. I-2	...5.45
Lackawanna, N.Y. B2	...5.45
Munhall, Pa. U5	...5.45
S. Chicago, Ill. U5	...5.45

PLATES

PLATES, Carbon Steel

Ala. City, Ala. R2	...4.50
Alliquippa, Pa. J5	...4.50
Ashland, Ky. (15) A10	...4.50
Bessemer, Ala. T2	...4.50
Bridgeport, Conn. N19	...4.75
Buffalo R2	...4.50
Clairton, Pa. U5	...4.50
Claymont, Del. C22	...4.50
Cleveland J5, R2	...4.60
Conestoga, Pa. L7	...4.80
Conshohocken, Pa. A3	...4.50
Detroit M1	...4.60
Ecorse, Mich. G5	...4.60
Fairfield, Ala. T2	...4.50
Fontana, Calif. (30) K1	...5.15
Gary, Ind. U5	...4.50
Geneva, Utah C11	...4.50
GaniteCity, Ill. G4	...4.70
Harrisburg, Pa. P4	...5.10
Houston S5	...4.60
Ind. Harbor, Ind. I-2, Y1	...4.50
Johnstown, Pa. B2	...4.50
Lackawanna, N.Y. B2	...4.50
LoneStar, Tex. L6	...4.85
Manfield, O. E6	...4.50
Minneapolis, Colo. C10	...5.35
Munhall, Pa. U5	...4.50
Newport, Ky. N9	...4.50
Pittsburgh J5	...4.50
Riverdale, Ill. A1	...4.725
Seattle B3	...5.40
Sharon, Pa. S3	...4.50
S. Chicago R2, U5, W14	...4.50
SparrowsPoint, Md. B2	...4.50
Steubenville, O. W10	...4.50
Warren, O. R2	...4.50
Weirton, W. Va. W6	...4.50
Youngstown R2, U5, Y1	...4.50

PLATES, Carbon Abras. Resist.

Claymont, Del. C22	...5.65
Fontana, Calif. K1	...6.30
Gary, Ind. U5	...5.65
Johnstown, Pa. B2	...5.65
SparrowsPoint, Md. B2	...5.65

PLATES, Wrought Iron

Economy, Pa. B14	...10.40
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PLATES, High-Strength Low-Alloy

Alliquippa, Pa. J5	...6.725
Bessemer, Ala. T2	...6.725
Clairton, Pa. U5	...6.725
Cleveland J5, R2	...6.725
Claymont, Del. C22	...6.725
Conestoga, Pa. L7	...6.725
Conshohocken, Pa. A3	...6.725
Ecorse, Mich. G5	...6.825
Fairfield, Ala. T2	...6.725
Fontana, Calif. (30) K1	...7.375
Gary, Ind. U5	...6.725
Geneva, Utah C11	...6.725
Houston S5	...6.825
Ind. Harbor, Ind. I-2, Y1	...6.725
Johnstown, Pa. B2	...6.725
Los Angeles B3	...6.725
Munhall, Pa. U5	...6.725
Pittsburgh J5	...6.725
Seattle B3	...6.825
Sharon, Pa. S3	...6.725
S. Chicago, Ill. U5, W14	...6.725
SparrowsPoint, Md. B2	...6.725
Youngstown U5, Y1	...6.725

PLATES, Alloy

Bridgeport, Conn. N19	...6.55
Claymont, Del. C22	...6.30
Conestoga, Pa. L7	...6.30
Fontana, Calif. K1	...6.95
Gary, Ind. U5	...6.30
Houston S5	...6.40
Ind. Harbor, Ind. Y1	...6.30
Johnstown, Pa. B2	...6.30
Munhall, Pa. U5	...6.30
Newport, Ky. N9	...6.30
Seattle B3	...7.20
Sharon, Pa. S3	...6.30
S. Chicago, Ill. U5, W14	...6.30
SparrowsPoint, Md. B2	...6.30
Youngstown Y1	...6.30

FLOOR PLATES

Cleveland J5	...5.575
Conshohocken, Pa. A3	...5.575
Harrisburg, Pa. P4	...5.575
Ind. Harbor, Ind. I-2	...5.575
Munhall, Pa. U5	...5.575
S. Chicago, Ill. U5	...5.575

PLATES, Ingot Iron

Ashland c.l. (15) A10	...4.75
Ashland c.l. (15) A10	...5.25
Cleveland c.l. R2	...5.10
Warren, O. c.l. R2	...5.10

BARS

BARS, Hot-Rolled Carbon

Ala. City, Ala. R2	...4.65
Alliquippa, Pa. J5	...4.65
Alton, Ill. L1	...4.85
Atlanta A11	...4.85
Bessemer, Ala. T2	...4.65
Birmingham C15	...5.15
Bridgeport, Conn. N19	...4.80
Buffalo R2	...4.65
Canton, O. R2	...4.75
Clairton, Pa. U5	...4.65
Cleveland R2	...4.65
Ecorse, Mich. G5	...4.75
Emeryville, Calif. J7	...5.40
Fairfield, Ala. T2	...4.65
FairlessHills, Pa. U5	...4.80
Fontana, Calif. K1	...5.35
Gary, Ind. U5	...4.65
Houston S5	...4.90
Ind. Harbor, Ind. I-2, Y1	...4.65
Johnstown, Pa. B2	...4.65
Joliet, Ill. P22	...4.90
KansasCity, Mo. S5	...4.65
Lackawanna, N.Y. B2	...4.65
Los Angeles B3	...5.35
Massillon, O. R2	...4.75
Midland, Pa. C18	...4.65
Milton, Pa. M18	...4.65
Minneapolis, Colo. C10	...5.10
Niles, Calif. P1	...5.00
N. Tonawanda, N.Y. B11	...4.65
Pittsburgh J5	...5.35
Pittsburgh J5	...5.35
Portland, Ore. O4	...5.40
Seattle B3, N14	...5.40
S. Chicago R2, U5, W14	...4.65
S. Duquesne, Pa. U5	...4.65
S. San Francisco, Calif. B3	...5.35
Sterling, Ill. (1) N15	...4.75
Sterling, Ill. N15	...4.75
Struthers, O. Y1	...4.65
Torrance, Calif. C11	...5.35
Warren, O. R2	...4.65
Weirton, W. Va. W6	...4.65
Youngstown R2, U5	...4.65

BARS, H.R. Lead Alloy

Warren, O. C17	...6.325
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BARS, Hot-Rolled Alloy

Bethlehem, Pa. B2	...5.575
Bridgeport, Conn. N19	...5.725
Buffalo R2	...5.575
Canton, O. R2, T7	...5.575
Clairton, Pa. U5	...5.575
Detroit R7	...5.575
Ecorse, Mich. G5	...5.675
Fontana, Calif. K1	...6.625
FairlessHills, Pa. U5	...5.725
Gary, Ind. U5	...5.575
Houston S5	...5.825
Ind. Harbor, Ind. I-2, Y1	...5.575
Johnstown, Pa. B2	...5.575
KansasCity, Mo. S5	...5.825
Lackawanna, N.Y. B2	...5.575
Los Angeles B3	...6.625
Massillon, O. R2	...5.575
Midland, Pa. C18	...5.575
S. Chicago R2, U5, W14	...5.575
S. Duquesne, Pa. U5	...5.575
Struthers, O. Y1	...5.575
Warren, O. C17	...5.575
Youngstown U5	...5.575

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

High-Strength	Low-Alloy
Alliquippa, Pa. J5	6.80
Bessemer, Ala. T2	6.80
Bethlehem, Pa. B2	6.80
Clairton, Pa. U5	6.80
Cleveland R2	6.80
Ecorse, Mich. G5	6.90
Fairfield, Ala. T2	6.80
Fontana, Calif. K1	7.50
Gary, Ind. U5	6.80
Houston S5	7.05
Ind. Harb., Ind. I-2, Y1	6.80
Johnstown, Pa. B2	6.80
Kansas City, Mo. S5	7.05
Lackawanna, N.Y. R2	6.80
Los Angeles B3	7.50
Pittsburgh J5	6.80
Seattle B3	7.55
St. Louis, Mo. W14	6.80
S. Duquesne, Pa. U5	6.80
S. San Francisco B3	7.55
Struthers, O. Y1	6.80
Warren, O. R2	6.80
Youngstown U5	6.80

Harbor, Ind. I-2, Y1.4.65
stown, Pa. B2 .....4.65
et, Ill. P22 .....4.65
ckawanna, N.Y. B2 .....4.90
Angles B3 .....4.65
ton, Pa. M18 .....4.65
nequa, Colo. C10 .....5.10
es, Calif. P1 .....5.00
tsburg, Calif. C11 .....5.35
tsburg J5 .....4.65
rtland, Oreg. O4 .....5.40
nd Springs, Okla. S5 .....5.15
ttle B3, N14 .....5.40
Chicago R2 .....4.65
Queens, Pa. U5 .....4.65
an Francisco, B3 .....5.40
arrowsPoint, Md. B2 .....4.65
pring, Ill. (1) N15 .....4.65
ring, Ill. N15 .....4.75
uthers, O. Y1 .....4.65
rance, Calif. C11 .....5.35
ngstown R2, U5, Y1.4.65

Reinforcing
Fabricated; to Consumers)
stown, Pa. ¼-1" B2.6.15
nas City, Kans. S5 .....6.45
ckawanna, N.Y. B2 .....6.17
ion, O. P11 .....5.90
tsburg U8 .....6.17
ttle B3, N14 .....6.60
arrowsPt. ½-1" B2.6.15
llamspott, Pa. B19 .....6.00

STEEL BARS
is, Pa. (3) J8 .....4.50
icagoHts. (3) C2, I-2.4.65
icagoHts. (4) C2, I-2.4.65
West, Tex. (26) T4 .....5.10
ankin, Pa. (3) F5 .....4.65
ankin, Pa. (4) F5 .....4.65
ine, O. (3) P11 .....4.65
ine, Ill. (3) R2 .....4.65
awanda (3) B12 .....4.50
awanda (4) B12 .....4.65
llamspott, Pa. (3) B19.4.65

Wrought Iron
onomy, Pa. (S.R.) B14 11.50
onomy, Pa. (D.R.) B14 14.30
onomy (Staybolt) B14 14.65
K.Rks. (S.R.) L5 .....11.50
K.Rks. (D.R.) L5 .....10.00
K.Rks. (Staybolt) L5.17.00

Acme Steel Co.
Alan Wood Steel Co.
Allegheny Ludlum Steel
Alloy Metal Wire Div.,
K. Porter Co. Inc.
American Shlm Steel Co.
American Steel & Wire
Div., U. S. Steel Corp.
Anchor Drawn Steel Co.
Angell Nail & Chaplet
Armco Steel Corp.
Atlantic Steel Co.
Babcock & Wilcox Co.
Bethlehem Steel Co.
Beth. Pac. Coast Steel
Blair Strip Steel Co.
Bliss & Laughlin Inc.
Braeburn Alloy Steel
Brainard Steel Div.,
Sharon Steel Corp.
E. & G. Brooke, Wick-
wire Spencer Steel Div.
Colo. Fuel & Iron Inc.
Buffalo Bolt Co., Div.,
Buffalo-Eclipse Corp.
Buffalo Steel Division
H. K. Porter Co. Inc.
A. M. Byers Co.
J. Bishop & Co.

Calstrip Steel Corp.
Calumet Steel Div.
Borg-Warner Corp.
Carpenter Steel Co.
Cleve. Cold Rolling Mills
Cold Metal Products Co.
Colonial Steel Co.
Colorado Fuel & Iron
Columbia-Geneva Steel
Columbia Steel & Shaft
Columbia Tool Steel Co.
Compressed Steel Shaft.
Connors Steel Div.
H. K. Porter Co. Inc.
Continental Steel Corp.
Copperweld Steel Co.
Crucible Steel Co.
Cumberland Steel Co.

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gauge and Heavier)

Ala. City, Ala. R2	4.325
Allenport, Pa. P7	4.325
Ashland, Ky. (8) A10	4.325
Cleveland J5, R2	4.325
Conshohocken, Pa. A3	4.375
Detroit (8) M1	4.425
Dravosburg, Pa. U5	4.325
Ecorse, Mich. G5	4.425
Fairfield, Ala. T2	4.325
Fairless Hills, Pa. U5	4.375
Fontana, Calif. K1	5.075
Gary, Ind. U5	4.325
Geneva, Utah C11	4.425
Granite City, Ill. G4	4.525
Ind. Harbor, Ind. I-2, Y1	4.325
Kokomo, Ind. C16	4.425
Lackawanna, N.Y. B2	4.325
Mansfield, O. E6, (37)	4.325
Munhall, Pa. U5	4.325
Newport, Ky. (8) N9	4.325
Niles, O. N12	4.325
Pittsburgh, Calif. C11	5.025
Pittsburgh J5	4.325
Portsmouth, O. P12	4.325
Riverdale, Ill. A1	4.55
Sharon, Pa. S3	4.325
S. Chicago, Ill. W14	4.325
Sparrows Point, Md. B2.4	4.325
Steubenville, O. W10	4.325
Warren, O. R2	4.325
Weirton, W. Va. W6	4.325
Youngstown U5, Y1	4.325

SHEETS, H.R. (19 Ga. & Lighter)
Ala. City, Ala. R2 .....5.625
Kokomo, Ind. C16 .....5.425
Niles, O. N12 .....5.325

SHEETS, H.R. Alloy
Ind. Harbor, Ind. Y1 .....7.20
Youngstown Y1 .....7.20

SHEETS, H.R.(14 Ga. & Heavier)	
High-Strength Low-Alloy	
Cleveland J5, R2	6.375
Conshohocken, Pa. A3 ..	6.425
Dravosburg, Pa. U5 ...	6.375
Ecorse, Mich. G5	6.475
Fairfield, Ala. T2	6.375
Fairless Hills, Pa. U5 ..	6.425
Fontana, Calif. K1	7.125

C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products
Dept. Wickwire Spencer
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
Div., Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof
Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Fifth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div.,
Franklin Warner Corp.
I-6 Irvine, E., Steel Tube
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.

Gary, Ind. U5 .....6.375
Ind. Harbor, Ind. I-2, Y1.6.375
Lackawanna (35) B2 .....6.375
Munhall, Pa. U5 .....6.375
Pittsburgh J5 .....6.375
Sharon, Pa. S3 .....6.375
S. Chicago, Ill. U5 .....6.375
SparrowsPoint (36) B2.6.375
Warren, O. R2 .....6.375
Weirton, W. Va. W6 .....6.375
Youngstown U5, Y1.6.375

SHEET, Hot-Rolled Ingot Iron
(18 Gauge and Heavier)
Ashland, Ky. (8) A10 .....4.575
Ind. Harbor, Ind. I-2 .....4.575

SHEETS, Cold-Rolled Steel
(Commercial Quality)
Allenport, Pa. P7 .....5.325
Cleveland J5, R2 .....5.325
Conshohocken, Pa. A3 .....5.375
Dravosburg, Pa. U5 .....5.325
Detroit M1 .....5.325
Ecorse, Mich. G5 .....5.425
Fairfield, Ala. T2 .....5.325
FairlessHills, Pa. U5 .....5.375
Follansbee, W. Va. F4 .....5.325
Fontana, Calif. K1 .....6.425
Gary, Ind. U5 .....5.325
GraniteCity, Ill. G4 .....5.525
Ind. Harbor, Ind. I-2, Y1.5.325
Lackawanna, N.Y. B2 .....5.325
Mansfield, O. E6 .....5.325
Middletown, O. A10 .....5.325
Newport, Ky. N9 .....5.325
Pittsburgh, Calif. C11 .....6.275
Pittsburgh J5 .....5.325
Portsmouth, O. P12 .....5.325
SparrowsPoint, Md. B2.5.325
Steubenville, O. W10 .....5.325
Warren, O. R2 .....5.325
Weirton, W. Va. W6 .....5.325
Youngstown U5 .....5.325

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....7.775
Dravosburg, Pa. U5 .....7.775
Ecorse, Mich. G5 .....7.975
FairlessHills, Pa. U5 .....7.925
Fontana, Calif. K1 .....8.975
Gary, Ind. U5 .....7.875
IndianaHarbor, Ind. Y1.7.875
Lackawanna (37) B2 .....7.875
Pittsburgh J5 .....7.875

J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Saw-
hill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div.,
Jones & Laughlin Steel
Corp.
M14 McInnes Steel Co.
M16 Md. Fins. & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div.,
U. S. Steel Corp.
Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.,
U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 NewEng. HighCarb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
Sharon Steel Corp.
N14 Northwest SteelRoll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

SparrowsPoint (38) B2.7.875
Warren, O. R2 .....7.875
Weirton, W. Va. W6 .....7.875
Youngstown Y1 .....7.875

SHEETS, Cold-Rolled Ingot Iron
Middletown, O. A10 .....5.825

SHEETS, Culvert
(16 Gauge) Alloy
Ashland, Ky. A10.6.90
Canon, O. R2 .....6.10
Dravosburg U5 .....6.10
Fairfield T2 .....6.10
Gary, Ind. U5 .....6.10
Ind. Harbor I-2 .....6.10
Kokomo, Ind. C16.6.20
MartinsFry. W10.6.10
Newport, Ky. N9.6.10
Pitts., Calif. C11.6.85
SparrowsPt. B2.6.10

SHEETS, Culvert—Pure Iron
Ashland, Ky. A10 .....7.15
Gary, Ind. U5 .....6.35
MartinsFry., O. W10 .....6.35

SHEETS, Galvanized Steel
Hot-Dipped
Ala. City, Ala. R2 .....5.851
Ashland, Ky. A10 .....5.851
Canon, O. R2 .....5.851
Dover, O. R1 .....5.851
Dravosburg, Pa. U5 .....5.851
Fairfield, Ala. T2 .....5.851
Gary, Ind. U5 .....5.851
GraniteCity, Ill. G4 .....6.05
Ind. Harbor, Ind. I-2 .....5.851
Kokomo, Ind. C16 .....5.951
MartinsFry, O. W10 .....5.851
Middletown, O. A10 .....5.851
Newport, Ky. N9 .....5.851
Niles, O. N12 .....5.851
Pittsburgh, Calif. C1 .....6.60
SparrowsPt. Md. B2 .....5.851
Steubenville, O. W10 .....5.851
Warren, O. R2 .....5.851
Weirton, W. Va. W6 .....5.851

*Continuous and noncontinuous.
†Continuous. ‡Noncontinuous.

SHEETS, Well Casing
Fontana, Calif. K1 .....6.575

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
Sub. of Barium Steel
Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division
Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div.,
Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebeling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div.,
Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.

SHEETS, Galvanized
High-Strength Low-Alloy
Dravosburg, Pa. U5 .....8.60
SparrowsPoint (39) B2 .....8.60

SHEETS, Galvannealed Steel
Canton, O. R2 .....6.25
Dravosburg, Pa. U5 .....6.25
Kokomo, Ind. C16 .....6.60
Newport, Ky. N9 .....6.25
Niles, O. N12 .....7.25

SHEETS, Galvanized Ingot Iron
(Hot-dipped Continuous)
Ashland, Ky. A10 .....6.10
Middletown, O. A10 .....6.10

SHEETS, Electrogalvanized
Cleveland (28) R2 .....6.70
Niles, O. (28) R2 .....6.70
Weirton, W. Va. W6 .....6.55

SHEETS, Aluminum Coated
Butler, Pa. A10 (type 1) 8.50
Butler, Pa. A10 (type 2) 8.60

SHEETS, Enameling Iron
Ashland, Ky. A10 .....5.90
Cleveland R2 .....5.90
Dravosburg, Pa. U5 .....5.90
Gary, Ind. U5 .....5.90
GraniteCity, Ill. G4 .....6.10
Ind. Harbor, Ind. I-2 .....5.90
Middletown, O. A10 .....5.90
Niles, O. N12 .....5.90
Youngstown Y1 .....5.90

BLUE STOCK, 29 Gage
Follansbee, W. Va. F4 .....7.75
Ind. Harbor, Ind. I-2 .....7.75
Yorkville, O. W10 .....7.75

SHEETS, Long Term Steel
(Commercial Quality)
Beechbottom, W. Va. W10 6.25
Gary, Ind. U5 .....6.25
Mansfield, O. E6 .....6.25
Middletown, O. A10 .....6.25
Niles, O. N12 .....6.25
Weirton, W. Va. W6 .....6.25

SHEETS, Long Term, Ingot Iron
Middletown, O. A10 .....6.65

S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
T2 Tenn. Coal & Iron Div.
U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division,
Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
Tonawanda Iron Div.
Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ubrich Stainless Steels
U8 U. S. Steel Supply Div.
U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Division,
H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Western Automatic
Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wheelwright Spencer Steel
Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div.,
International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel
Y1 Youngstown Sheet&Tube

Key to Producers

STRIP

STRIP, Hot-Rolled Carbon

Ala. City, Ala. (27) R2	4.325
Alpenport, Pa. P7	4.325
Alton, Ill. L1	4.50
Ashland, Ky. (8) A10	4.325
Atlanta A1	4.525
Bessemer, Ala. T2	4.325
Birmingham C15	4.825
Bridgeport, Conn. N19	4.325
Buffalo (27) R2	4.325
Conshohocken, Pa. A3	4.375
Detroit M1	4.425
Ecorse, Mich. G5	4.425
Fairfield, Ala. T2	4.325
Fontana, Calif. K1	5.075
Gary, Ind. U5	4.325
Ind. Harbor, Ind. I-2, Y1	4.325
Johnstown, Pa. (25) B2	4.325
Lackawanna, N.Y. (24) B2	4.325
Los Angeles (25) B3	5.075
Milton, Pa. M18	4.325
Minneapolis, Colo. C10	5.425
New Britain (10) S15	4.325
N. Tonawanda, N.Y. B11	4.325
Pittsburg, Calif. C11	5.075
Portsmouth, O. P12	4.325
Riverdale, Ill. A1	4.325
San Francisco S7	5.05
Seattle (25) B3	5.325
Seattle N14	5.40
Sharon, Pa. S3	4.325
S. Chicago, Ill. W14	4.325
S. San Francisco (25) B3	5.075
Sparrows Point, Md. B2	4.325
Sterling (1) N15	4.325
Stirling, Ill. N15	4.425
Torrance, Calif. C11	5.075
Warren, O. R2	4.325
Weirton, W. Va. W6	4.325
Youngstown U5	4.325

STRIP, Hot-Rolled Alloy

Bridgeport, Conn. N19	7.50
Carnegie, Pa. S18	7.20
Fontana, Calif. K1	8.85
Gary, Ind. U5	7.20
Ind. Harbor, Ind. Y1	7.20
Los Angeles B3	8.40
Newport, Ky. N9	7.20
Sharon, Pa. S3	7.20
S. Chicago W14	7.20
Youngstown U5	7.20

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	4.575
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STRIP, Cold-Rolled Carbon

Anderson, Ind. G6	6.25
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland J5	6.25
Cleveland A7	6.25
Conshohocken, Pa. A3	6.30
Dearborn, Mich. D3	6.35
Detroit D2, M1, P20	6.35
Dover, O. G6	6.25
Ecorse, Mich. G5	6.35
Follansbee, W. Va. F4	6.25
Fontana, Calif. K1	8.10
Franklin Park, Ill. T6	6.35
Ind. Harbor, Ind. I-2	6.35
Ind. Harbor, Ind. Y1	6.25
Indianapolis C8	6.40
Lackawanna, N.Y. B2	6.25
Los Angeles C1	6.30
New Bedford, Mass. R10	6.30
New Britain (10) S15	6.70
New Castle, Pa. B4	6.25
New Haven, Conn. A7	6.70
New Haven, Conn. D2	6.70
New Kensington, Pa. A6	6.25
Pawtucket, R.I. R3	6.90
Pawtucket, R.I. N8	6.80
Pittsburg J5	6.25
Portsmouth, O. P12	6.25
Riverdale, Ill. A1	6.35
Rome, N.Y. (32) R6	6.25

Sharon, Pa. S3	6.25
Sparrows Pt., Md. B2	6.25
Trenton, N.J. (31) R5	7.80
Wallingford, Conn. W2	6.70
Warren, O. R2, T5	6.25
Weirton, W. Va. W6	6.25
Worcester, Mass. A7	6.80
Youngstown Y1	6.25
Youngstown C8	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie, Pa. S18	13.45
Cleveland A7	13.45
Dover, O. G6	13.45
Franklin Park, Ill. T6	13.45
Harrison, N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket, R.I. N8	13.80
Sharon, Pa. S3	13.45
Worcester, Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7	9.10
Dearborn, Mich. D3	9.20
Dover, O. G6	9.30
Ecorse, Mich. G5	9.20

STRIP, Cold-Finished Spring Steel (Annealed)

Baltimore T6	7.30	9.25	10.80	12.95	15.65
Boston T6	7.55	9.25	10.80	12.95	15.65
Bristol, Conn. W1	8.95	10.50	12.65	15.65	16.65
Carnegie, Pa. S18	7.10	9.05	10.60	12.75	15.45
Cleveland A7	8.95	10.50	12.65	15.35	16.35
Cleveland C7	7.10	9.05	10.60	12.75	15.45
Dearborn, Mich. D3	7.10	9.05	10.60	12.75	15.45
Detroit D2	7.00	8.95	10.50	12.65	15.35
Dover, O. G6	7.00	8.95	10.50	12.65	15.35
Follansbee, W. Va. F4	7.10	8.95	10.50	12.65	15.35
Franklin Park, Ill. T6	7.10	8.95	10.50	12.65	15.35
Harrison, N.J. C18	7.15	9.10	10.50	12.65	15.35
Indianapolis C8	7.00	8.95	10.50	12.65	15.35
New Britain, Conn. (10) S15	7.00	8.95	10.50	12.65	15.35
New Castle, Pa. B4	7.45	9.25	10.80	12.95	15.65
New Haven, Conn. D2	7.00	8.95	10.50	12.65	15.35
New Kensington, Pa. A6	7.00	8.95	10.50	12.65	15.35
New York W3	7.00	8.95	10.50	12.65	15.35
Pawtucket, R.I. N8	7.55	9.25	10.80	12.95	15.65
Riverdale, Ill. A1	7.10	8.95	10.50	12.65	15.35
Rome, N.Y. (32) R6	7.00	8.95	10.50	12.65	15.35
Sharon, Pa. S3	7.00	8.95	10.50	12.65	15.35
Trenton, N.J. R5	7.45	9.25	10.80	12.95	15.65
Wallingford, Conn. W2	7.00	8.95	10.50	12.65	15.35
Warren, O. T5	7.00	8.95	10.50	12.65	15.35
Weirton, W. Va. W6	7.00	8.95	10.50	12.65	15.35
Worcester, Mass. A7	7.55	9.25	10.80	12.95	15.65
Youngstown C8	7.65	9.35	10.90	13.05	15.75
Youngstown C8	7.00	8.95	10.50	12.65	15.35

•••0.065 C, max.

Spring Steel (Tempered)

Bristol, Conn. W1	14.40	17.60	21.00
Buffalo, W12	14.40	17.60	21.00
Franklin Park, Ill. T6	14.40	17.60	21.00
Harrison, N.J. C18	14.40	17.60	21.00
New York W3	14.40	17.60	21.00
Trenton, N.J. R5	14.40	17.60	21.00
Worcester, Mass. W12	14.40	17.60	21.00
Worcester, Mass. A7, T6	14.40	17.60	21.00
Youngstown C8	14.75	17.95	21.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)

Beech Bottom, W. Va. W10	9.95	10.95	11.85
Brackenridge, Pa. A4	9.95	10.95	11.85
Mansfield, O. E6	8.40	9.35	10.95
Newport, Ky. N9	8.40	9.35	10.95
Niles, O. N12	8.40	9.35	10.95
Vandergrift, Pa. U5	9.35	10.95	11.85
Warren, O. R2	8.40	9.35	10.95
Zanesville, O. A10	9.35	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semi-processed 1/2c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
Brackenridge, Pa. A4	8.80	9.80	10.40	11.40	12.40
Granite City, Ill. G4	8.80	9.80	10.40	11.40	12.40
Indiana Harbor, Ind. I-2	8.80	9.80	10.40	11.40	12.40
Vandergrift, Pa. U5	8.80	9.80	10.40	11.40	12.40
Vandergrift, Pa. U5	8.80	9.80	10.40	11.40	12.40
Warren, O. R2	8.80	9.80	10.40	11.40	12.40
Zanesville, O. A10	10.10	10.70	11.70	12.60	13.60

H.R. SHEETS (22 Ga., cut lengths)

Beech Bottom, W. Va. W10	12.80	13.35	13.85	14.85
Brackenridge, Pa. A4	12.80	13.35	13.85	14.85
Newport, Ky. N9	12.80	13.35	13.85	14.85
Vandergrift, Pa. U5	12.80	13.35	13.85	14.85
Zanesville, O. A10	12.80	13.35	13.85	14.85

C.R. COILS & CUT LENGTHS (22 Ga.)

Brackenridge, Pa. A4	14.85	15.85	17.45	17.95	13.55
Butler, Pa. A10	14.85	15.85	17.45	17.95	13.55
Vandergrift, Pa. U5	14.85	15.85	17.45	17.95	13.55
Warren, O. R2	14.85	15.85	17.45	17.95	13.55

*Semi-processed. †Fully processed only. ‡Coils, annealed, semi-processed 1/2c lower. §Coils, 1/2-cent higher.

Ind. Harbor, Ind. Y1	9.30
Lackawanna, N.Y. B2	9.10
Sharon, Pa. S3	9.10
Sparrows Point, Md. B2	9.10
Warren, O. R2	9.10
Weirton, W. Va. W6	9.10
Youngstown Y1	9.30

STRIP, Electrogalvanized

Cleveland A7	6.25
Dover, O. G6	6.25
Riverdale, Ill. A1	6.55
Youngstown C8	6.25
Warren, O. T5	6.25
Warren, O. R2	6.45
Weirton, W. Va. W6	5.75
Worcester, Mass. A7	6.80

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon, Pa. S3	6.55
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TIGHT COOPERAGE HOOP

Atlanta A11	5.05
Riverdale, Ill. A1	4.90
Sharon, Pa. S3	4.75
Youngstown U5	4.75

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)

Albuquerque, Pa. J5	0.25 lb	0.50 lb	0.75 lb
Dravosburg, Pa. U5	\$7.90	\$8.15	\$8.40
Fairfield, Ala. T2	7.90	8.15	8.40
Fairless Hills, Pa. U5	8.00	8.25	8.50
Gary, Ind. U5	8.00	8.25	8.50
Granite City, Ill. G4	7.90	8.15	8.40
Indiana Harbor, Ind. I-2, Y1	8.00	8.25	8.50
Niles, O. R2	7.90	8.15	8.40
Pittsburg, Calif. C11	7.90	8.15	8.40
Sparrows Point, Md. B2	8.65	8.90	9.15
Weirton, W. Va. W6	8.00	8.25	8.50
Yorkville, O. W10	7.90	8.15	8.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Albuquerque, Pa. J5	6.575
Niles, O. R2	7.075

TINPLATE, American 1.25 lb

Albuquerque, Pa. J5	\$9.20	\$9.45
Dravosburg, Pa. U5	9.20	9.45
Fairfield, Ala. T2	9.30	9.55
Fairless Hills, Pa. U5	9.30	9.55
Gary, Ind. U5	9.20	9.45
Ind. Har. I-2, Y1	9.20	9.45
Pitts., Calif. C11	9.95	10.20
Sp. Pt., Md. B2	9.30	9.55
Weirton, W. Va. W6	9.20	9.45
Yorkville, O. W10	9.20	9.45

BLACK PLATE, (Base Box)

Albuquerque, Pa. J5	\$7.00
Dravosburg, Pa. U5	7.00
Fairfield, Ala. T2	7.10
Fairless Hills, Pa. U5	7.10
Gary, Ind. U5	7.00
Granite City, Ill. G4	7.10
Ind. Harbor, Ind. I-2, Y1	7.00
Niles, O. R2	7.00
Pittsburg, Calif. C11	7.75

WIRE

WIRE, Manufacturers Bright, Low Carbon

Alabama City, Ala. R2	6.25
Albuquerque, Pa. J5	6.25
Alton, Ill. L1	6.425
Atlanta A11	6.45
Bartonsville, Ill. K4	6.35
Buffalo W12	6.25
Chicago W13	6.25
Cleveland A7	6.25
Crawfordsville, Ind. M8	6.35
Donora, Pa. A7	6.25
Duluth, Minn. A7	6.25
Fairfield, Ala. T2	6.25
Fostoria, O. (24) S1	6.45
Houston S5	6.50
Jacksonville, Fla. M8	6.77
Johnstown, Pa. B2	6.25
Joliet, Ill. A7	6.25
Kansas City, Mo. S5	6.50
Kokomo, Ind. C16	6.35
Los Angeles B3	7.20
Minneapolis, Colo. C10	6.50
Monessen, Pa. P7	6.25
Newark 6-8 ga I-1	6.25
N. Tonawanda B11	6.25
Palmer, Mass. W12	6.55
Pittsburg, Calif. C11	7.20
Portsmouth, O. P12	6.25
Rankin, Pa. A7	6.25
S. Chicago, Ill. R2	6.25
S. San Francisco C10	7.20
Sparrows Point, Md. B2	6.35
Sterling, Ill. (1) N15	6.25
Sterling, Ill. N15	6.35
Struthers, O. Y1	6.25
Waukegan, Ill. A7	6.25
Worcester, Mass. A7	6.55

WIRE, MB Spring, High Carbon

Albuquerque, Pa. J5	7.90
Alton, Ill. L1	8.075
Bartonsville, Ill. K4	8.00
Buffalo W12	7.90
Cleveland A7	7.90
Donora, Pa. A7	7.90
Duluth, Minn. A7	7.90
Fostoria, O. S1	7.95
Johnstown, Pa. B2	7.90
Los Angeles B3	8.85
Milbury, Mass. (12) N6	8.20
Minneapolis, Colo. C10	8.15
Monessen, Pa. P16	7.90
Muncie, Ind. I-7	8.10
Palmer, Mass. W12	8.20
Pittsburg, Calif. C11	8.85
Portsmouth, O. P12	7.90
Roebing, N.J. R5	8.20
S. Chicago, Ill. R2	7.90
S. San Francisco C10	8.85
Sparrows Pt., Md. B2	8.00
Struthers, O. Y1	7.90
Trenton, N.J. A7	8.20
Waukegan, Ill. A7	7.90
Worcester A7, J4, T6, W12	8.20

WIRE, Upholstery Spring

Albuquerque, Pa. J5	7.60
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HOLLOWARE ENAMELING

Black Plate (29 Gage)	
Dravosburg, Pa. U5	6.40
Gary, Ind. U5	6.40
Granite City, Ill. G4	6.40
Ind. Harbor, Ind. Y1	6.40
Yorkville, O. W10	6.40

WIRE

(Continued)

IRE, Tire Bead	
irtonville, Ill. K4	14.15
nessen, Pa. P16	14.20
ebbing, N.J. R5	14.35
IRE, Cold-Rolled Flat	
nderson, Ind. G6	9.00
allmore T6	9.30
uffalo W12	9.00
leveland A7	9.00
rawfordville, Ind. M8	9.00
over, O. G6	9.00
ostoria, O. S1	9.00
runkin Park, Ill. T6	9.10
okomo, Ind. C16	9.00
assillon, O. R8	9.00
illwaukee C23	9.20
ionessen, Pa. P16	9.00
uckett, R.I. N8	9.30
iverdale, Ill. A1	9.10
one, N.Y. R6	9.00
renton, N.J. R5	9.30
orcester A7, T6, W12	9.30
AIL, Stock	
To Dealers & Mfrs. (7) Col.	
Alabama City, Ala. R2	152
Albuquerque, Pa. J5	152
Atlanta A11	152
artonsville, Ill. K4	154
Chicago, Ill. W13	152
leveland A9	152
rawfordville, Ind. M8	154
onora, Pa. A7	152
uluth, Minn. A7	152
airfield, Ala. T2	152
alveston, Tex. D7	157
ouston, Tex. S5	157
ohnstown, Pa. B2	152
olet, Ill. A7	152
ansas City, Mo. S5	157
okomo, Ind. C16	154
onoma, Colo. C10	157
onessan, Pa. P7	152
ittsburg, Calif. C11	171
rankin, Pa. A7	152
Chicago, Ill. R2	152
parrows Pt., Md. B2	154
terling, Ill. (1) N15	152
orcester, Mass. A7	158
AILS, CUT (100 lb keg)	
To Dealers (33)	
heeling, W.Va. A3	\$9.05
heeling, W.Va. W10	9.05
APLES, Polished Stock	
To Dealers & Mfrs. (7) Col.	
Albuquerque, Pa. J5	152
Atlanta A11	152
artonsville, Ill. K4	154
rawfordville, Ind. M8	154
onora, Pa. A7	152
uluth, Minn. A7	152
airfield, Ala. T2	152
ohnstown, Pa. B2	152
olet, Ill. A7	152
okomo, Ind. C16	154
onoma, Colo. C10	157
onessan, Pa. P7	152
ittsburg, Calif. C11	171
rankin, Pa. A7	152
parrows Pt., Md. B2	154
terling, Ill. (1) N15	152
orcester, Mass. A7	158
E WIRE, Automatic Baler	
4 1/2 Ga. (Per 97 lb Net Box)	
Coil No. 3150	
Alabama City, Ala. R2	\$9.35
artonsville, Ill. K4	9.45
uffalo W12	9.35
rawfordville, Ind. M8	9.46
onora, Pa. A7	9.35
uluth, Minn. A7	9.35
ohnstown, Pa. B2	9.35
olet, Ill. A7	9.35
okomo, Ind. C16	9.45
on Angeles B3	10.14
onoma, Colo. C10	9.60
ittsburg, Calif. C11	10.43
Chicago, Ill. R2	9.35
parrows Pt., Md. B2	9.45
terling, Ill. N15	9.35
Coil No. 6500 Stand.	
Alabama City, Ala. R2	\$9.65
artonsville, Ill. K4	9.75
uffalo W12	9.60
rawfordville, Ind. M8	9.75
onora, Pa. A7	9.65
uluth, Minn. A7	9.65
ohnstown, Pa. B3	9.65
olet, Ill. A7	9.65
okomo, Ind. C16	9.75
on Angeles B3	10.45
onoma, Colo. C10	9.90
ittsburg, Calif. C11	10.13
Chicago, Ill. R2	9.65
parrows Pt., Md. B2	9.75
terling, Ill. N15	9.65
Coil No. 6500 Interim	
Alabama City, Ala. R2	\$9.70
artonsville, Ill. K4	9.80
uffalo W12	9.70

Crawfordville, Ind. M8	9.80
Donora, Pa. A7	9.70
Duluth, Minn. A7	9.70
Johnstown, Pa. B2	9.70
Joliet, Ill. A7	9.70
Kokomo, Ind. C16	9.80
Los Angeles B3	10.50
Minneapolis, Colo. C10	9.95
Pittsburg, Calif. C11	10.50
S. Chicago, Ill. R2	9.70
Sparrows Pt., Md. B2	9.80
Sterling, Ill. N15	9.70

WIRE, Barbed	Col.
Alabama City, Ala. R2	175**
Albuquerque, Pa. J5	172*
Atlanta A11	181
Bartonsville, Ill. K4	181
Crawfordville, Ind. M8	181
Donora, Pa. A7	175*
Duluth, Minn. A7	175*
Fairfield, Ala. T2	175*
Houston, Tex. S5	180*
Johnstown, Pa. B2	179*
Joliet, Ill. A7	175*
Kansas City, Mo. S5	180*
Kokomo, Ind. C16	180*
Minneapolis, Colo. C10	180**
Monessen, Pa. P7	179*
Pittsburg, Calif. C11	195*
Rankin, Pa. A7	175*
S. Chicago, Ill. R2	175**
S. San Francisco C10	195**
Sparrows Point, Md. B2	181*
Sterling, Ill. (1) N15	179*

WOVEN Fence, 9-15 ga. Col.	
Ala. City, Ala. R2	162*
Ala. City, 17 ga. R2	257**
Ala. City, 18 ga. R2	267**
Albuquerque, Pa. 9-14 1/2 ga J5	165*
Atlanta A11	168
Bartonsville, Ill. K4	168
Crawfordville, Ind. M8	168
Donora, Pa. A7	162*
Duluth, Minn. A7	162*
Fairfield, Ala. T2	162*
Houston, Tex. S5	167*
Johnstown, Pa. (43) B2	166
Joliet, Ill. A7	162*
Kansas City, Mo. S5	167*
Kokomo, Ind. C16	164*
Minneapolis, Colo. C10	167**
Monessen, Pa. 9 ga. P17	166*
Pittsburg, Calif. C11	185*
Rankin, Pa. A7	162*
S. Chicago, Ill. R2	162**
Sterling, Ill. (1) N15	166*

Wire (16 Gage) Stone Stone	
Ala. City R2	14.50 16.05*
Bartonsville K4	14.60 16.50
Buffalo W12	14.50
Cleveland A7	14.50
Crawfordville M8	14.60 16.50
Fostoria, O. S1	14.60 16.15*
Johnstown B2	14.15 16.40*
Kokomo C16	14.60 16.15*
Minneapolis C10	14.75 16.45**
Palmer, Mass. W12	14.50 16.05*
Pitts., Calif. R1	14.85 16.40*
S. Chicago R2	14.50 16.05**
Sparrows Pt. B2	14.60 16.50*
Sterling(1) N15	14.50 16.45**
Waukegan A7	14.50 16.05*
Worcester A7	14.80

WIRE, Merchant Quality	
(6 to 8 gage) An'd Galv.	
Ala. City, Ala. R2	7.40 7.80**
Albuquerque J5	7.40 7.925*
Atlanta A11	7.50 8.10
Bartonsville(48) K4	7.50 8.075
Buffalo W12	7.40 8.80*
Cleveland A7	7.40
Crawfordville M8	7.50 8.075
Donora, Pa. A7	7.40 7.80*
Duluth, Minn. A7	7.40 7.80*
Fairfield, Ala. T2	7.40 7.80*
Houston, Tex. S5	7.65 8.05*
Jacks'ville, Fla. M8	7.90 8.475
Johnstown B2(48) K4	7.40 7.975*
Joliet, Ill. A7	7.40 7.80*
Kansas City, Mo. S5	7.65 8.05*
Kokomo C16	7.50 7.90*
Los Angeles B3	8.35 8.925*
Minneapolis C10	7.65 8.05*
Monessen P7 (48) K4	7.40 7.975*
Palmer, Mass. W12	7.70 8.10*
Pitts., Calif. C11	8.35 8.75*
Pitts., Mass. O. P12	7.40 7.80*
Rankin A7	7.40 7.80*
S. Chicago R2	7.40 7.80**
S. San Fran. C10	8.35 8.75**
Spar'w Pt. B2(48) K4	7.50 8.075*
Str'w(1) (48) N15	7.40 8.00**
Struthers, O. (48) Y1	7.40 7.90*
Worcester, Mass. A7	7.70

*Based on 12.50c zinc; †5c zinc; ‡10c zinc; §Less than 10c zinc; **Subject to zinc equalization extras. ††13c zinc.

FASTENERS

(Base discounts, full case quantity, per cent off list to consumer, f.o.b. mill)

Carriage, Machine Bolts
Full-Size Body (cut thread)
1 1/2" x 6" and smaller 61
Larger than 1 1/2" diam. and all diams. longer than 6" 55
Under-Size Body (rolled thread; not nutted):
1/2" x 6" and smaller. 61

1 1/2" x 4" and smaller and shorter are not nutted.

NUTS	
Reg. & Heavy Square Nuts, all sizes	61
H. P. Reg. & Heavy Hex Nuts:	
3/8" & smaller	64
3/8" to 1 1/2" incl.	63
1 1/2" to 1 1/2" incl.	65
1 1/2" & larger	61
O.P. Reg. & Heavy Hex Nuts	
3/8" & smaller	64
3/8" & larger	61
Semifinished & Finished Nuts	
3/8" & smaller	66
3/8" & larger	63
Semifinished Slotted Reg. & Heavy Hex Nuts	
3/8" & smaller	66
3/8" & larger	63
Hot Galvanized Nuts, all types	
1 1/2" & smaller	44
(On above items add 25% for less than case quantities)	

CAP SCREWS	
(New Std., hexagon head, upset, packages)	
Bright:	
6" and shorter:	
1/2" through 3/4" diam.	34
3/4" & 1/2" diam.	31
3/4", 1/2", 1"	8
Longer than 6"	
1/2" through 3/4" diam.	3
3/4" through 1" diam.	+13

High Carbon, Heat-treated:	
6" and shorter:	
1/2" through 3/4" diam.	20
3/4" & 1/2" diam.	16
3/4", 1/2", 1"	+11
Longer than 6"	
1/2" through 3/4" diam.	+23
3/4" through 1" diam.	+41
(New Std. Hexagon head, upset, bulk)	

Bright:	
1/2" x 6" & smaller & shorter	49
1/2" & 3/4" diam. x 6"	48
3/4", 1/2", 1" x 6" & shorter	31
High Carbon, Heat-treated:	
1/2" x 6" & smaller & shorter	41
1/2" x 3/4" diam. & 6"	39
3/4", 1/2", 1" x 6" & shorter	20

MACHINE SCREW NUTS & STOVE BOLT NUTS (Bulk)	
No. 2 to 1/4" Incl., Square:	
25,000 to 199,999 pieces	20
200,000 or more pieces	27
No. 2 to 1/4" Incl., Hex:	
25,000 to 199,999 pieces	18
200,000 or more pieces	25
MACHINE SCREWS, SLOTTED (Bulk)	
No. 2 to 1/4" diam. Incl.:	
25,000 to 199,999 pieces	20
200,000 or more pieces	27
1/2" to 3/4" diam. Incl.:	
15,000 to 99,999 pieces	20
100,000 or more	27

Footnotes

- (1) Chicago Base.
- (2) Angles, flats, bands.
- (3) Merchant.
- (4) Reinforcing.
- (5) 1 1/2" in. to less than 1 7/8" area.
- (6) Chicago or Birm. base.
- (7) To jobbers, 3 cols. lower.
- (8) 16 Ga. and heavier.
- (9) Pittsburgh base.
- (10) Cleveland & Pitts. base.
- (11) Worcester, Mass., base.
- (12) Add 0.25c for 17 Ga. & heavier.
- (13) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
- (14) 40 lb and under.
- (15) Flats only; 0.25 in. & heavier.

BOILER TUBES

Net base c.i. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D.	B.W.	Seamless	Elec. Weld
In.	Gage	H.R.	C.D.
1	13	21.06	20.42
1 1/4	13	24.94	20.45
1 1/2	13	27.57	22.61
1 3/4	13	32.57	26.71
2	13	36.51	29.93
2 1/4	13	41.12	33.72
2 1/2	12	44.63	38.60
2 3/4	12	49.16	40.31
3	12	53.72	43.65
3 1/2	12	56.76	46.55

RAILWAY MATERIALS

RAILS	No. 1	No. 2	No. 2 Under
Bessemer, Pa. U5	4.725	4.625	4.675
Ensley, Ala. T2	4.725	4.625	4.675
Fairfield, Ala. T2	4.725	4.625	4.675
Gary, Ind. U5	4.725	4.625	4.675
Huntington, W. Va. W7	4.725	4.625	4.675
Indiana Harbor, Ind. I-2	4.725	4.625	4.675
Johnstown, Pa. B2	4.725	4.625	4.675
Lackawanna, N.Y. B2	4.725	4.625	4.675
Minneapolis, Colo. C10	4.725	4.625	4.675
Steelton, Pa. B2	4.725	4.625	4.675
Williamsport, Pa. S19	4.725	4.625	4.675

TIE PLATES

Fairfield, Ala. T2	5.825
Gary, Ind. U5	5.825
Ind. Harbor, Ind. I-2	5.825
Lackawanna, N.Y. B2	5.825
Minneapolis, Colo. C10	5.825
Seattle B3	5.775
Steelton, Pa. B2	5.825
Torrance, Calif. C11	5.775

TRACK BOLTS (20) Treated

Cleveland R2	12.40
Kansas City, Mo. S5	12.40
Lebanon, Pa. B2	12.40
Minneapolis, Colo. C10	12.40
Pittsburgh O3, P14	12.40
Seattle B3	12.90

AXLES

Ind. Harbor, Ind. S13	7.25
Johnstown, Pa. B2	7.25

METAL POWDER

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)	
Sponge Iron:	
98+% Fe, annealed.	9.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	8.25
Minus 20 mesh	9.00
Swedish, c.i.f. Camden, N. J., c.i. in bags.	9.50
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. Shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of 1/2 in. x 1 1/2 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	34.00
Unannealed (99+% Fe) (minus 325 mesh)	57.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns.	83.00-148.00
Aluminum:	
Atomized, 500 lb. depending frght. allowed	34.50
Carlots	36.50
Ton lots	36.50
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	38.00-50.00*
Bronze, 5000-lb lots	61.25-64.50*
Copper:	
Electrolytic	56.75
Reduced	56.75
Lead	22.80
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	\$1.00
Nickel-Silver, 5000-lb lots	58.75-61.50*
Phosphor-Bronze, 4 1/2-ton lots	58.50
Silicon	47.50
Solder	7.00*
Stainless Steel, 302	99.00
Stainless Steel, 316	\$1.32
Tin	14.50*
Zinc, 5000-lb lots	18.75-32.50*
Tungsten	Dollars
Melting grade, 99%	60 to 200 mesh
1000 lb and over	4.50
Less than 1000 lb.	4.65
Chromium, electrolytic	
99.2% Cr min.	3.50

- *Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni, **64% Cu, 18% Zn, 18% Ni.
- (32) Buffalo base.
 - (33) To jobbers, deduct 20c.
 - (34) 9.00c for cut lengths.
 - (35) 72" and narrower.
 - (36) 54" and narrower.
 - (37) 13 Ga. & heavier; 60" & narrower.
 - (38) 14 Ga. & lighter; 48" & narrower.
 - (39) 48" and narrower

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2	2½	3	3½	4	5	6
List Per Ft	37c	58.5c	76.5c	92c	10.99	14.48	19.92
Pounds Per Ft	3.68	5.82	7.62	9.20	10.89	14.81	19.18
Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*
Alquippa, Pa. J5	6.5 +10	10.5 +7.25	13 +4.75	14.5 +3.25	14.5 +3.25	14 +3.75	16.5 +1
Ambridge, Pa. N2	6.5	10.5	13	14.5	14.5	14	16.5
Lorain, O. N3	6.5 +10	10.5 +7.25	13 +4.75	14.5 +3.25	14.5 +3.25	14 +3.75	16.5 +1
Youngstown Y1	6.5 +10	10.5 +7.25	13 +4.75	14.5 +3.25	14.5 +3.25	14 +3.75	16.5 +1

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	6.5 +10	10.5 +7.25	13 +4.75	14.5 +3.25	14.5 +3.25	14 +3.75	16.5 +1
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BUTT WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¾	1	1½	2	2½	3	4
List Per Ft	5.5c	6c	6c	8.5c	11.5c	17c	23c
Pounds Per Ft	0.24	0.42	0.57	0.85	1.13	1.68	2.28
Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*

Alquippa, Pa. J5	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Alton, Ill. L1	24	8	24.5	8.5	26	8.75	26	8.75	26	8.75	21	5.75	23.5	7
Benwood, W. Va. W10	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	7
Butler, Pa. F6	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	7
Etna, Pa. N2	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Fairless Hills, Pa. N3	24	8	24.5	8.5	26	8.75	26	8.75	26	8.75	21	5.75	23.5	7
Fontana, Calif. K1	14.5 +1.5	15 +1	16.5	+0.75	16.5	+0.75	16.5	+0.75	16.5	+0.75	11.5	+3.75	14	+2
Ind. Harbor, Ind. Y1	25	9	25.5	9.5	27	9.75	27	9.75	27	9.75	22	6.75	24.5	8
Lorain, O. N3	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Sharon, Pa. S4	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Sharon, Pa. M6	24	8	24.5	8.5	26	8.75	26	8.75	26	8.75	21	5.75	23.5	7
Sparrows Pt., Md. B2	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Youngstown R2, Y1	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Wheatland, Pa. W9	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9

Size—Inches	1½	2	2½	3	3½	4
List Per Ft	27.5c	37c	58.5c	76.5c	92c	10.99
Pounds Per Ft	2.73	3.68	5.82	7.62	9.20	10.89
Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*

Alquippa, Pa. J5	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Alton, Ill. L1	24	8	24.5	8.5	26	8.75	26	8.75	26	8.75	21	5.75	23.5	7
Benwood, W. Va. W10	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	7
Etna, Pa. N2	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Fairless Hills, Pa. N3	24	8	24.5	8.5	26	8.75	26	8.75	26	8.75	21	5.75	23.5	7
Fontana, Calif. K1	14.5 +1.5	15 +1	16.5	+0.75	16.5	+0.75	16.5	+0.75	16.5	+0.75	11.5	+3.75	14	+2
Ind. Harbor, Ind. Y1	25	9	25.5	9.5	27	9.75	27	9.75	27	9.75	22	6.75	24.5	8
Lorain, O. N3	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Sharon, Pa. M6	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Sparrows Pt., Md. B2	24	8	24.5	8.5	26	8.75	26	8.75	26	8.75	21	5.75	23.5	7
Youngstown R2, Y1	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9
Wheatland, Pa. W9	26	10	26.5	10.5	28	10.75	28	10.75	28	10.75	23	7.75	25.5	9

*Galvanized pipe discounts based on current price of zinc (13.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Revolving	Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F.			C.R. Strip; Flat Wire
						Bars; Wire	Plates	Sheets	
201	17.00	21.50	31.00	31.00	31.00	31.00	31.00	31.00	31.00
202	18.25	24.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00
301	17.75	22.25	31.00	31.00	31.00	31.00	31.00	31.00	31.00
302	19.00	24.75	31.00	31.00	31.00	31.00	31.00	31.00	31.00
302B	20.25	26.50	31.00	31.00	31.00	31.00	31.00	31.00	31.00
303	20.25	26.75	31.00	31.00	31.00	31.00	31.00	31.00	31.00
304	20.25	26.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00
304L	20.25	26.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00
306	21.75	28.25	31.00	31.00	31.00	31.00	31.00	31.00	31.00
308	22.00	29.00	31.00	31.00	31.00	31.00	31.00	31.00	31.00
309	29.50	38.25	46.75	53.50	53.50	54.75	58.25	67.00	67.00
309S	31.50	41.00	51.00	59.00	58.50	60.25	63.75	74.00	74.00
310	37.25	48.00	62.25	72.25	68.50	73.50	75.25	78.75	78.75
314	37.25	48.00	62.25	72.25	68.50	73.50	75.25	78.75	78.75
316	31.50	40.25	51.25	59.50	58.25	60.75	64.00	68.25	68.25
316L	31.50	40.25	51.25	59.50	58.25	60.75	64.00	68.25	68.25
317	37.25	48.25	62.75	72.75	73.50	74.50	77.00	83.75	83.75
321	25.00	32.00	38.25	44.00	44.25	45.25	49.25	54.25	54.25
18-8CbTa	29.25	38.00	45.75	52.25	53.25	53.50	58.00	66.50	66.50
403	20.25	26.75	31.00	31.00	31.00	31.00	31.00	31.00	31.00
405	17.50	23.00	28.75	31.00	32.25	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	30.50	31.75	36.25	36.25
416	20.25	26.75	31.00	31.00	31.00	31.00	31.00	31.00	31.00
420	23.50	30.25	31.00	31.00	31.00	31.00	31.00	31.00	31.00
430	15.25	19.75	26.00	30.00	28.75	31.00	32.25	36.75	36.75
430F	15.25	19.75	26.00	30.00	28.75	31.00	32.25	36.75	36.75
431	16.00	20.50	26.50	30.50	29.75	31.50	33.00	38.00	38.00
446	16.00	20.50	26.50	30.50	29.75	31.50	33.00	38.00	38.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless:	Plates Carbon Base		Sheets Carbon Base
	10%	20%	
302	30.30	36.05	30.50
304	30.30	36.05	32.50
304-L	32.30	37.95	32.50
310	41.30	47.00	47.00
316	35.50	41.40	47.00
316-L	40.00	46.10	47.00
316-CB	41.15	48.45	47.00
321	32.00	37.75	37.25
347	34.40	41.40	48.25
405	25.80	33.35	37.25
410	25.30	32.85	37.25
430	25.30	32.85	37.25
Inconel	49.45	65.45	67.00
Nickel	41.05	55.65	67.00
Nickel, Low Carbon	43.25	60.05	67.00
Monel	43.95	59.55	67.00
Copper*			48.00

Copper*	Strip, Carbon Base Cold Rolled		Both Sides Cold Rolled
	10%	20%	
Copper*	30.00	38.00	38.00

*Deoxidized. Production points: Stainless-clad sheets New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7; New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	\$ per lb	Grade	\$ per lb
Regular Carbon	0.275	5% Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%)						\$ per lb
W	Cr	V	Co	Mo		
20.25	4.25	1.6	12.25	...	4.09	
18.25	4.25	1	4.75	...	2.305-2.47	
18	4	2	9	...	2.675-2.877	
18	4	2	...	...	1.76
18	4	1	...	...	1.60
13.75	3.75	2	5	...	2.24	
13.5	4	3	...	...	1.86
9	3.5	...	...	...	1.18
6	4	2	5	...	1.10	
6	4	...	...	...	1.35
6	4	3	...	...	1.35
6	4	1	8.5	...	0.96	

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

ig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer		Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District					Youngstown District				
Alabama City, Ala. R2	54.50	55.00†	....	....	Hubbard, O. Y1	....	....	59.00	....
Birmingham R2	54.50	55.00†	....	....	Sharpsville, Pa. S8	58.50	....	59.00	59.50
Birmingham U6	....	55.00†	59.00	....	Youngstown Y1	....	....	59.00	59.50
Edward, Ala. W15	54.50	55.00†	59.00	....	Youngstown U5	58.50	....	....	59.50
Cincinnati, deld.	....	62.70	....	....	Mansfield, O., deld.	63.40	....	63.90	64.40
Buffalo District					Duluth I-3	58.50	59.00	59.00	59.50
Buffalo H1, R2	58.50	59.00	59.50	60.00	Erie, Pa. I-3	58.50	59.00	59.00	59.50
Tonawanda, N.Y. W12	58.50	59.00	59.50	60.00	Everett, Mass. E1	62.00	62.50	63.00	....
Tonawanda, N.Y. T9	....	59.00	59.50	60.00	Fontana, Calif. K1	....	65.00	....	....
Boston, deld.	69.15	69.65	70.15	....	Geneva, Utah C11	58.50	59.00	....	....
Rochester, N.Y. deld.	61.52	62.02	62.52	....	Granite City, Ill. G4	60.40	60.90	61.40	....
Syracuse, N.Y. deld.	62.62	63.12	63.62	....	Ironton, Utah C11	58.50	59.00	....	....
Chicago District					LoneStar, Texas L6	....	55.00*	....	....
Chicago I-3	58.50	59.00	59.00	59.50	Minnequa, Colo. C10	60.50	61.00	61.50	....
Chicago U5	58.50	....	59.00	....	Rockwood, Tenn. T3	....	55.00†	59.00	....
Chicago R2	58.50	....	59.00	....	Toledo, O. I-3	58.50	59.00	59.00	59.50
Chicago, Ill. Y1	58.50	59.00	59.00	59.50	Cincinnati, deld.	64.25	64.75	....	....
Chicago, Ill. U5, W14	58.50	....	59.00	59.50					
Milwaukee, deld.	60.67	61.17	61.17	61.67					
Muskegon, Mich. deld.	....	65.30	65.30	....				
Cleveland District									
Cleveland A7, R2	58.50	59.00	59.00	59.50					
Akron, O., deld.	61.25	61.75	61.75	62.25					
Marion, O. N3	58.50	....	....	59.50					
Mid-Atlantic District									
Allegheny, Pa. B2	60.50	61.00	61.50	62.00					
New York, deld.	....	64.78	65.28	....				
Newark, deld.	63.52	64.02	64.52	65.02					
Richmond, Pa. B10	60.50	61.00	61.50	62.00					
Hester, Pa. P14	60.50	61.00	61.50	....				
Philadelphia, deld.	62.16	62.66	63.16	....				
Steelton, Pa. B2	60.50	61.00	61.50	62.00					
Wedeland, Pa. A3	60.50	61.00	61.50	62.00					
Philadelphia, deld.	62.16	62.66	63.16	63.66					
Wilmington, N.Y. R2	60.50	61.00	61.50	62.00					
Pittsburgh District									
Allegheny, Pa. P6	58.50	59.00	59.00	....				
Pittsburgh (N&S slides),	....	....	....	....	
Altoona, deld.	....	60.37	60.37	60.87					
McKees Rocks, deld.	....	60.04	60.04	60.54					
Lawrenceville, Homestead,	....	....	....	....	
Wilmerding, Monaca, deld.	....	60.66	60.66	61.16					
Verona, Trafford, deld.	60.69	61.19	61.19	61.69					
Brackenridge, deld.	60.95	61.45	61.45	61.95					
Bessemer, Pa. U5	58.50	....	59.00	59.50					
Hartton, Rankin, S. Duquesne, Pa. U5	58.50	....	....	....		
McKeesport, Pa. N3	58.50	....	....	59.50					
Midland, Pa. C18	58.50	....	....	....		

*Phos. 0.51-0.75%; \$56. Phos. 0.31-0.50%.
†Intermediate (Phos. 0.31-0.69%), \$56.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phosphorus iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add \$2 per ton and each additional 0.25%, add \$1 per ton.

BLAST FURNACE SILVER PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add \$1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson, O. G2, J1	\$67.50
Buffalo H1	\$68.75

ELECTRIC FURNACE SILVER PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add \$1 for each 0.5% Si to 18%; \$1 for each 0.50% Mn over 1%; \$2 per gross ton premium for 0.045% max P)
Niagara Falls, N.Y. P15 \$91.00
Keokuk, Iowa, (Open-hearth & Fdry, freight allowed K2) 90.08
Keokuk, O.H. & Fdry, 12 1/2 lb piglets, 18% Si, frgt allowed K2 93.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	\$72.50
Steelton, Pa. B2 (Phos. 0.035% max)	\$68.50
Philadelphia, deld.	70.05
Troy, N.Y. R2 (Phos. 0.035% max)	66.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 25 cents per 100 lb except: Buffalo, Cleveland, Erie, 30 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Birmingham, Chattanooga, Jackson, 15 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, 10 cents; Atlanta, Houston, Seattle, Spokane, no charge.

	SHEETS			STRIP			BARS			Standard			PLATES		
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.†	H.R. Alloy 4140††	Structural Shapes	Carbon	Floor			
Atlanta	7.14	8.20	8.87	....	7.40	....	7.42	9.39	....	7.63	7.49	9.48			
Baltimore	7.03	8.32	8.37	....	7.65	....	7.61	8.62*	13.44	7.93	7.21	8.87			
Birmingham	6.80	7.90	8.85	....	7.06	....	7.08	9.35	....	7.28	6.99	9.10			
Boston	7.70	8.81	10.27	45.67	7.96	....	7.83	9.53	14.45	8.13	7.89	9.36			
Buffalo	6.80	8.05	9.77	....	7.15	....	7.10	7.90	13.10	7.40	7.15	8.70			
Chattanooga	6.95	8.10	8.60	....	7.20	....	7.20	9.18	....	7.45	7.25	9.05			
Chicago	6.80	8.09	8.50	49.05	7.06	....	7.08	7.75	12.85	7.28	6.99	8.46			
Cincinnati	6.92	8.08	8.90	46.10	7.30	....	7.32	8.05	13.09	7.75	7.28	8.71			
Cleveland	6.80	8.09	8.85	49.18	7.16	....	7.14	7.85	12.91	7.61	7.16	8.63			
Detroit	6.99	8.28	8.78	43.50	7.34	....	7.36	8.04	13.05	7.75	7.27	8.65			
Erie, Pa.	6.80	7.90	8.85	....	7.15	....	7.08	7.85	....	7.40	7.15	8.63			
Houston	7.85	8.75	10.49	....	8.15	....	8.25	9.85	14.00	8.20	7.80	9.20			
Jackson, Miss.	7.10	8.20	9.20	....	7.40	....	7.40	9.44	....	7.60	7.45	9.30			
Los Angeles	8.05	10.00	11.00	....	8.35	....	8.05	11.25	14.25	8.30	8.05	10.25			
Milwaukee	6.89	8.18	8.59	....	7.15	....	7.17	7.94	12.94	7.45	7.08	8.55			
Moline, Ill.	7.15	8.44	8.85	....	7.41	....	7.43	8.10	....	7.63	7.34	....		
New York	7.46	8.68	9.44	44.95	8.07	....	7.96	9.48	13.28	7.99	7.76	9.19			
Norfolk, Va.	7.25	....	....	....	7.65	....	7.65	9.50	....	7.95	7.45	8.95			
Philadelphia	7.14	8.42	9.35	45.98	7.67	9.02	7.64	8.46	13.16	7.74	7.37	8.69**			
Pittsburgh	6.80	8.09	9.20	49.00	7.16	....	7.08	7.85	12.85	7.28	6.99	8.46			
Portland, Oreg.	7.80	8.80	10.65	....	8.00	....	7.95	12.20	15.00	7.85	7.75	9.60			
Richmond, Va.	7.00	....	9.47	....	7.65	....	7.70	8.85	....	7.95	7.20	9.10			
St. Louis	7.09	8.38	9.19	43.89	7.35	....	7.37	8.14	13.14	7.68	7.28	8.75			
St. Paul	7.46	8.59	9.16	....	7.72	....	7.74	8.51	13.51	7.94	7.65	9.12			
San Francisco	8.10	9.65	10.15	51.65	8.35	....	8.05	11.20	14.25*	8.25	8.05	10.25			
Seattle	8.55	10.40	10.80	54.00	8.65	....	8.35	11.70	14.60	8.30	8.20	10.10			
Spokane	8.55	11.00*	10.80	....	9.05	....	8.35	11.80	15.35	8.30	8.20	10.60			
Washington	7.50	8.79	7.97	....	8.12	....	8.08	9.09	....	8.40	7.68	9.34			

Prices do not include gauge extras; prices include gauge and coating extras (based on 12.50-cent zinc), except in Birmingham (coating extra excluded); includes 35-cent special bar quality extras; **1/4-in. and heavier; †as annealed; ††under 1/2-in.

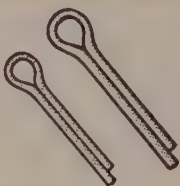
Base quantities. 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; 1-500 to 9999 lb; 1-400 to 999 lb; 1-4000 lb and over; 1-1000 to 1999 lb; 1-1000 lb and over; 1-1500 to 3999 lb; 1-2000 to 3999 lb; 1-f.o.b. local delivery in lots of 10,000 lb and over.

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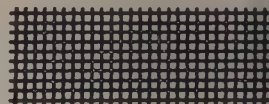
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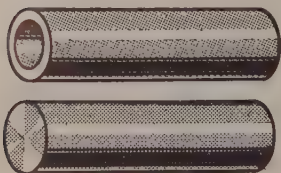
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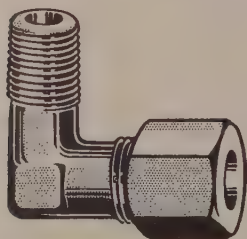
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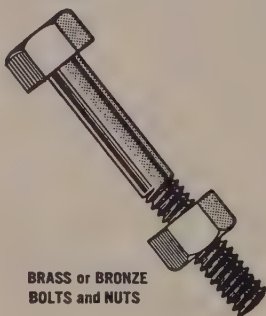
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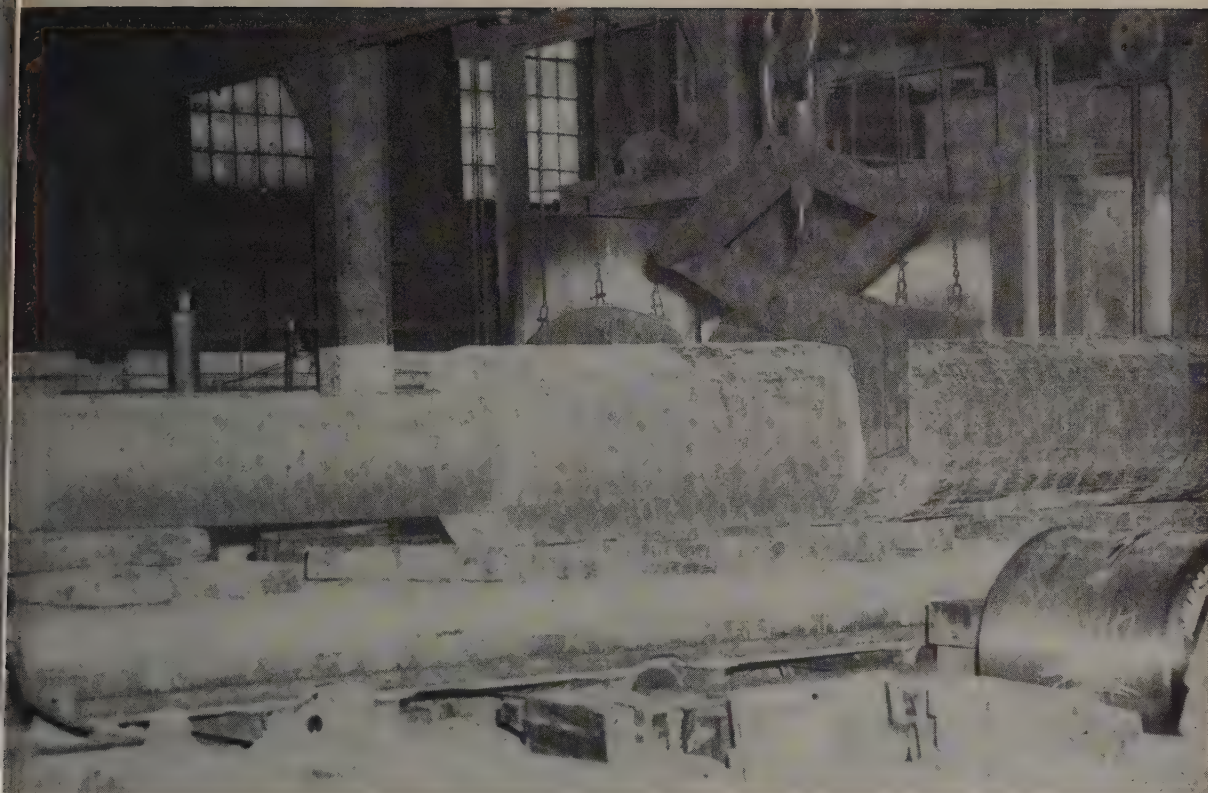
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Forging Steel: Not Enough

A LEADING producer of nickel-alloy forging steel caught an employee stealing nickel from its warehouse for sale on the gray market. The incident points up a situation: While that metal lacks the luster of gold, it's just as valuable to nickel-starved buyers of forging steel.

Users aren't stealing nickel to bolster supply, but they'll consider any legitimate alternative.

Nickel has been diverted from the stockpile since March. The latest diversion (for the November-December period) totals 8.2 million lb. One hitch: Part of the nickel diverted is of a quality expensive to use in steel-making. Diversions for the first quarter of next year are expected to be at or close to the present rate.

Who's Hurt—Stainless producers have complained of the nickel shortage for several years, but the scarcity extends across a wide range of metalworking—for example, turbine and generator shafting and gears and a host of other manufactured products requiring alloy-nickel forging steel billets, blooms and slabs.

Stainless and alloy steels use a lot more nickel than is required for forging steel. In one large corporation, forging steel is allotted 50,000 lb of nickel a month, while stainless steel uses 400,000 lb.

Sold Out—"It's impossible for us to get more of our firm's nickel allotment," says one forging sales manager. "Stainless and alloy production use six to eight times as much nickel, and that output has been trimmed by the nickel shortage in a period of high demand for stainless. No one is getting enough nickel in our firm."

The U. S. Bureau of Mines says stainless steels used 30.7 million lb of nickel in 1947, 41.8 million lb in 1950 and 40.8 million lb last year.

Other steels used 34.8 million lb in 1947, 35.6 million lb in 1950 and only 27.3 million lb last year.

While forging's share of nickel declines, new orders for forgings requiring nickel continue to increase.

Problem—How can the orders be filled? The Air Force, the Atomic Energy Commission and the government stockpile take big chunks of

nickel production. As long as their purchasing programs stay high, nickel will be hard to get.

Only Chance—Forging steelmakers find that in some cases substitutions provide the answer to the nickel shortage. In several gear applications, fabricators use chrome-molybdenum alloys instead of nickel-bearing alloy steel with no loss of strength. "Our customers are accustomed to the nickel shortage by now," report officials of Erie Forge & Steel Co., Erie, Pa. "Many of them volunteer to work out substitutes for nickel in their products."

Despite co-operation by customers, complete substitution of other alloy grades for nickel-bearing grades is impossible. Fabricators must have nickel in applications demanding top service under corrosive or high-temperature, high-pressure conditions.

No Substitutes—There's no substitute for 3-per-cent nickel in turbine and generator shafts in power equipment. Nickel is essential in aircraft gearing and in shafting used for ships.

Most new orders for shafting are for the Navy's shipbuilding program. Orders are increasing rapidly, but producers are assured of enough nickel because the shafts are needed for defense.

Gearmakers have lost production

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because of the nickel shortage. Nickel is needed for gears that must have great shock resistance and toughness (as in off-the-road equipment and large trucks). Not all gearmakers use nickel, but those who do have scanty supplies.

Perennial Problem—"Users will have to live with the nickel shortage for some time." That's the discouraging prediction of forgers. Charles H. Smith, Steel Improvement & Forge Co., Cleveland, says: "There is a great shortage of nickel steel for nonrated orders." Reports another user of nickel-bearing forging steel: "In the first quarter we'll get 40 per cent of what we need."

Despite the constant temptation to divert all available nickel to badly needed stainless production, integrated mills insist they will maintain a "fair distribution of nickel." Forging steel sales managers are trying to reassure customers that they won't be forgotten. But producers and users agree that the shortage will grow more severe before it lessens.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 153 & 154

Sheet demand continues strong, with the mills sold out for the first quarter on all the major grades and virtually so on specialties. Most first quarter schedules of sellers allow for carry-over of a month to six weeks (some for as much as two months on some grades).

Most consumers will be getting more tonnage in the first quarter of next year than they received in the fourth quarter this year, but quotas will fall below indicated requirements.

New England consumers will be dependent on carry-over shipments until well into February.

Several producers last week announced revisions in extras for hot and cold-rolled sheets. Jones & Laughlin posted an increase in hot-rolled sheet extras of 5 to 15 cents per 100 lb in gage and width extras for 14-gage and lighter; 10 cents for drawing quality and special soundness steels; 10 cents in specification extras for ordinary firebox and higher quality sheets; 10 cents in chemical requirement extras for copper, silicon and carbon (over 0.40 per cent). Changes in cold-rolled extras are 20 cents per 100 lb for drawing quality killed and special soundness steels; 10 cents for copper and silicon chemical requirements. Packaging extras for hot and cold-rolled sheets both were increased by nominal amounts.

Armco Steel Corp., Middletown, O., and Republic Steel Corp., Cleveland, also announced revisions in extras

on hot and cold-rolled sheets. Expectations are that other producers will take similar action.

Due to error in transmission, no prices on cold-finished strip recently announced by American Steel & Wire Division, U. S. Steel Corp., were accurately reported in the Dec. issue of STEEL.

The new price on cold-rolled New Haven, Conn., is \$6.70 per 100 lb, down \$6 per ton from the former price. The Worcester, Mass., price of \$6.80 also is off \$6 per ton, as the price of \$6.80 on electrogalvanized strip at Worcester. Also, the price on 0.26 to 0.40 carbon, cold-finished spring steel at \$7.65 Worcester, down \$6.

The prices on cold-finished spring steel, 0.41 carbon and over, were raised \$2 per ton. These were the only advances effected—STEEL had indicated the increase was generally applied on cold-finished strip.

Changes also were made in extras for size, and straightening and cutting, as well as a few revisions in quality and chemistry extras for low carbon strip. Packaging extras also were revised, upward and downward. The changes became effective Dec. 1.

Plates . .

Plate Prices, Page 152

Claymont Steel has resumed operation of the larger of its two plate mills, following a long suspension for repairs. The Claymont, Del. producer should provide some relief in the tight supply situation. This mill has blanked out January production but is accepting business for February shipment.

Generally, plate producers see no change in demand through the first quarter next year. Sales continue heavy and backed up railroad and construction volume will keep them busy through the first half, at the least. Some conversion deals are reported at Pittsburgh.

Increasing difficulty is experienced in placing light gage plates in New England. Mill allotments are smaller, and, in some cases, are tied in with a given ratio of heavier gages.

Steel Bars . . .

Bar Prices, Page 152

Hot-rolled carbon bar producers are facing far more first quarter business than they can handle promptly. They are still turning away tonnage orders for the period. Some are booked up completely for the three months; others are accepting orders from month to month.

Some mills can still accept hot-rolled, alloy-bar tonnage for rolling in late February. Deliveries, how-



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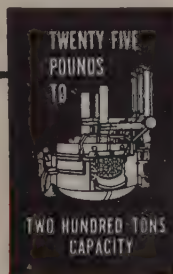
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ever, are much more extended on the average, due to extra processing.

Cold-finished barmakers are sold out well into the first quarter. They are having little success in cutting delivery time, with hot-rolled bar deliveries running as much as two months behind schedule.

Farm equipment manufacturers are optimistic over 1956 prospects, despite some uncertainties in the farm situation. With continuing heavy requirements from automotive and general manufacturing industries, pressure on steel bars throughout the first half of next year seems certain.

Bar users in New England are short of supplies. Producers are booking February orders, cutting tonnage around 10 per cent for the third month in some cases.

Tubular Goods . . .

Tubular Goods Prices, Page 156

A. W. McKinney, president, National Supply Co., Pittsburgh, expects his company's sales this year will substantially exceed the previous record of \$237.2 million chalked up in 1953. He cites industry forecasts that demand for oil will break all records in 1956.

"Drilling of oil and gas wells is at an unprecedented rate, causing high demand for the pipe and drilling and production equipment that we manufacture," said Mr. McKinney.

New England utilities are finding it difficult to place seamless pipe orders for first quarter delivery.

Trunk pipeline orders extend through next year and will keep seamless supplies tight for other uses. Carbon mechanical tubing deliveries are around six to seven weeks with demand heavier.

Demand for cast iron pipe is seasonally slow.

Wire . . .

Wire Prices, Pages 154 & 155

Specialty wire orders are booked well into January. Leading in demand is hard drawn, oil tempered and spring wire. In merchant wire, seasonal declines are in evidence. Demand for fencing, barbed wire and nails drops with the beginning of winter. Also off are sales of construction items, including welded wire fabric.

Most consumers are getting enough wire to maintain operations, but they are unable to build inventories. Exceptions in New England include the users of upholstery wire. In some cases curtailed coiling schedules are due to failure to anticipate sufficient lead time. Most consumers are buying on a more forward basis.

One of the heaviest inquiries for noncorrosive reinforcing fabric, 600,000 squares, closes with the Corps of Engineers, Memphis, Tenn., Dec. 20. Also required are 10.2 million side twist wires and 1.5 million end twist wires. This office placed a contract for 18,816,000 linear ft of steel wire strand with the Tennessee Coal & Iron Division, U. S. Steel Corp. The American Chain & Cable Co. will supply 7,400,000 ft of tow target cable, costing \$216,880, to the Topeka Air Force station.

Structural Shapes . . .

Structural Shape Prices, Page 152

Fabricating shops are becoming booked ahead further. Despite a seasonal decline in construction, more tonnage is being placed than most shops are fabricating. Some of the larger fabricators in the East are promising delivery in 11 to 12 months. At Chicago, they are becoming wary of making new commitments.

Shortage of plain material continues, with no early supply relief in sight. Uncertainty and delayed deliveries are making it difficult for the fabricating shops to fulfill their delivery promises.

Fabricated prices in New England, \$25 to \$30 a ton higher than at midyear, more accurately reflect plain material and labor costs.

Bridge construction in the Pacific Northwest promises to be active next year.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

13,230 tons, office building for the Tishman interests, 666 Fifth ave., New York, to Bethlehem Steel Co., Bethlehem, Pa.
4650 tons, manufacturing and office building, American Brass Division, Anaconda Wire & Cable Co., Terra Haute, Ind., to Bethlehem Steel Co., Bethlehem, Pa.
3000 tons, power plant unit No. 4, American Gas & Electric Service Corp., Relief, O., to Ingalls Iron Works, Birmingham, Ala.
2425 tons, 14 grade separation structures, Connecticut turnpike, projects 308-01 and 308-02, Westport-Fairfield and Westport, Conn., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through L. G. De Falice & Son Inc., North Haven, Conn., general contractor.
2100 tons, superstructure, St. Lucie canal, Florida state turnpike, to Mount Vernon Bridge Co., Mt. Vernon, O.
1800 tons, four buildings, International Business Machines Corp., Owego, N. Y., to Harris Structural Steel Co., New York.
1610 tons, state highway bridges, Southeast expressway, Boston-Milton, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Savin Construction Co., East Hartford, Conn., general contractor (reported in STEEL, Nov. 21, as involving 1350 tons).
1450 tons, 14-story apartment, 136 E. 55th St., New York, through Emery Roth & Sons, to Harris Structural Steel Co., that city.
1300 tons, seven overpassing structures, Connecticut turnpike, Stratford-Milford, Conn., to Schacht Structural Steel Co., New York; D. V. Frione & Co. Inc., New Haven, Conn., general contractor; also 665 tons, steel piles, and 865 tons, reinforcing bars.
1300 tons, office building, Connecticut Mutual Life Co., Hartford, Conn., to Harris Structural Steel Co., New York; Robert

Glenn Co., New York and Hartford, general contractor.
1000 tons, transmission towers, Long Island Lighting Co., Hicksville, N. Y., to Lehig Structural Steel Co., Allentown, Pa.
900 tons, research center, General Foods Corp., Tarrytown, N. Y., through George A. Fuller Co., to Grand Iron Works, Bronx, New York.
875 tons, shipping center, Dover, N. J., to Oltmer Iron Works, Jersey City, N. J.
850 tons, contract 537, section 37-K, Lackawanna county, Pennsylvania, through George M. Brewster & Son, general contractor, to Pine Brook Iron Works, Scranton, Pa.
670 tons, science building, University of Connecticut, Storrs, Conn., to Haarmann Steel Co., Holyoke, Mass.; Anderson-Fairclough Construction Co., Hartford, Conn., general contractor.
620 tons, building, Carborundum Co., Logan, O., through Brown & Matthews, New York to R. C. Mahon, Detroit.
590 tons, high school, Seaford, N. Y., to Lasker Goldman Corp., general contractor, to Grand Iron Works, Bronx, New York.
550 tons, power plant unit No. 1, Public Service Co. of Colorado, Denver, through Elbasco Services, New York, to Kansas City Structural Steel Co., Kansas City, Kans.
500 tons, carpet plant, Landrum, S. C., through Hanover Construction Co., general contractor, to Southern Engineering Co., Charlotte, N. C.
480 tons, grade crossing, Bruckner boulevard, Bronx, New York, through Frank Mascali & Son, general contractor, to Prospect Iron Works Inc., Brooklyn, N. Y.
440 tons, terminal and office, Associated Transport, Brooklyn, N. Y., through Adson Builders, to Pecker Iron Works Inc., Brooklyn, N. Y.
400 tons, engine parts, Alco Products Inc., Schenectady, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.
400 tons, addition, open-hearth department, Alan Wood Steel Co., Conshohocken, Pa., to Bethlehem Steel Co., Bethlehem, Pa.
385 tons, state bridge, Lycoming county, Pa., to the Anthracite Bridge Co., Scranton, Pa.
350 tons, repairs and alterations to Bethlehem ore bridges, Sparrows Point, Md., to Bethlehem Steel Co., Bethlehem, Pa., through McKiernan-Terry Corp.
320 tons, four warehouse buildings for David O. Evans, two at Elizabeth, N. J., and two at Elizabethtown, N. J., to Bethlehem Steel Co., Bethlehem, Pa.
260 tons, state bridge, Naugatuck river, Connecticut, to Bethlehem Steel Co., Bethlehem, Pa.; Foundation Corp., New York, general contractor.
225 tons, Long Island Railroad bridge at Manhasset, L. I., through Horn Construction Co., general contractor, to American Bridge Division, U. S. Steel Corp., Pittsburgh.
200 tons, garage, Erie Mining Co., Aurora, Minn., to Bethlehem Steel Co., Bethlehem, Pa.
170 tons, state bridge, Washington county, New York, through Collins Bros., general contractor, to Phoenix Bridge Co., Phoenixville, Pa.
120 tons, cargo building No. 84, Idlewild Airport, Long Island, N. Y., through Laurence J. Rice, to Simon Holland & Son Inc., Brooklyn, N. Y.

STRUCTURAL STEEL PENDING

6000 tons, superstructure and approaches, Morrison street bridge, Portland, Ore.; bids to John W. West, purchasing agent, Multnomah county, Portland, Ore., Feb. 1.
3000 tons, superstructure, Fairfax bridge, Missouri river, near Kansas City, Kans.; bids Dec. 15, county clerk, Platte City, Mo.
1295 tons, five grade separation structures, Connecticut turnpike, Milford, Conn.; Lizza & Sons Inc., Oyster Bay, N. Y., low on general contract; also, 555 tons of steel piles; 540 tons, reinforcing bars, and 350 tons, mat reinforcing.
945 tons, six bridges, Connecticut turnpike, Milford-Orange, Conn., Lizza & Sons Inc., Oyster Bay, N. Y., low on general contract; also 670 tons, reinforcing bars, and 410 tons of mat reinforcing.
900 tons, junior high school 61, Brooklyn, N. Y., bids Dec. 19.
900 tons, public school No. 141, Brooklyn, N. Y., bids Dec. 7.

tons, junior high school No. 204, Queens, New York, Dec. 1.
 tons, public school No. 140, Bronx, New York, bids Dec. 15.
 tons, branch bank building, Portland, reg.; bids in.
 tons, public school No. 261, Brooklyn, N. Y., bids Dec. 13.
 tons, three bridges, Fall River-Boston expressway, Avon-Brockton-Stoughton, Mass.; bids Dec. 20, state, Boston.
 tons, pump plant additions, Hanford Works, general contract to Morrison-Knudsen Inc., Seattle, low at \$1,809,580; Isaacson Iron Works, Seattle, is low on the structural.
 tons, state highway bridges, Stockbridge, Mass.; J. F. Fitzgerald Construction Co., Boston, low on general contract.
 tons, state highway bridge, Woolwich, Me.; Bridge Construction Co., Augusta, Me., is low on the general contract.

REINFORCING BARS . . .

REINFORCING BARS PLACED

25 tons, 12 bridges, Connecticut turnpike, Darien-Norwalk and Westport, Conn., to Milton Steel Products Division, Merritt-Chapman & Scott Corp., Milton, Pa.; Savin Construction Co., East Hartford, Conn., general contractor.
 25 tons, 14 grade separations and highway, Connecticut turnpike, projects 308-01 and 308-02, Westport-Fairfield and Westport, Conn., to Truscon Steel Division, Republic Steel Corp., Boston, through L. G. De Falice & Son Inc., North Haven, Conn., general contractor; also, 1150 tons steel bearing piles to Bethlehem Steel Co., Bethlehem.
 40 tons, substructure, bridge, Housatonic river, Connecticut turnpike, Stratford-Milford, Conn., to Milton Steel Products Division, Merritt-Chapman & Scott Corp., Milton, Pa.; Savin Construction Co., East Hartford, Conn., general contractor.
 0 tons, overpassing and underpassing structures, Connecticut turnpike, Milford, Conn., Milton Steel Products Division, Merritt-Chapman & Scott Corp., Milton, Pa.; Savin Construction Co., East Hartford, Conn., general contractor.
 0 tons, plastics plant, Phillips Chemical Co., Pasadena, Tex., to Peden Iron & Steel Co., Houston, through Farnsworth & Chambers Co. Inc., Houston, general contractor.
 0 tons, five steel beam bridges, Spaulding turnpike, Dover, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Me., through Landers & Griffin Inc., Portsmouth, N. H., general contractor.
 0 tons, Washington state highway bridge, Snohomish county, to Northwest Steel Rolling Mills Inc., Seattle; Harry Hawkins, Seattle, general contractor, low at \$131,696.

REINFORCING BARS PENDING

23 tons, Washington state T-beam bridge, Adams county; general contract to Goodfellow Bros., Wenatchee, Wash., low at \$220,849.

PLATES . . .

PLATES PLACED

5 tons, six roof tanks, Public Service Electric & Gas Co., Linden, N. J., to Hammond Iron Works, Warren, Pa.
 0 tons, 7600 ft of 36-in., welded-steel water pipe for Portland, Ore., system extension; general contract to P. S. Lord Co., Portland, low at \$176,438.
 0 tons, coke drum supports, Yorktown Va., through Lummus Co., to A. O. Smith Corp., Milwaukee.

PLATES PENDING

0 tons, bulk storage tanks, Elmendorf and Galena Air Bases, Alaska; bids in to U. S. Engineer.
 0 tons, two fuel storage tanks, naval air station, Corpus Christi, Tex.; bids Dec. 21.
 0 tons, bulk fuel system storage, Fairchild Air Field, Spokane, Wash.; general contract to Furnace Construction Co., and M. A. Robbins, Redmonds, Wash., low at \$200,576.
 0 tons, 5000-bbl jet fuel tank and facilities, Paine Air Base, Everett, Wash.; bids to U. S. Engineer, Seattle, Dec. 29.
 0 tons, 400,000-gal steel standpipe, also 5000 ft of 8-in. steel pipe; bids to Maude S.

Hartman, clerk, Benton City, Wash., Dec. 14.

PIPE . . .

CAST IRON PIPE PENDING

80 tons, system extension; bids to Grants Pass, Ore.

STEEL PIPE PENDING

400 tons, 29,200 ft of 14-gage steel water pipe, Kirkland, Wash.; Mallory & Compton Inc., Seattle, low at \$92,985.

RAILS, CARS . . .

LOCOMOTIVES PLACED

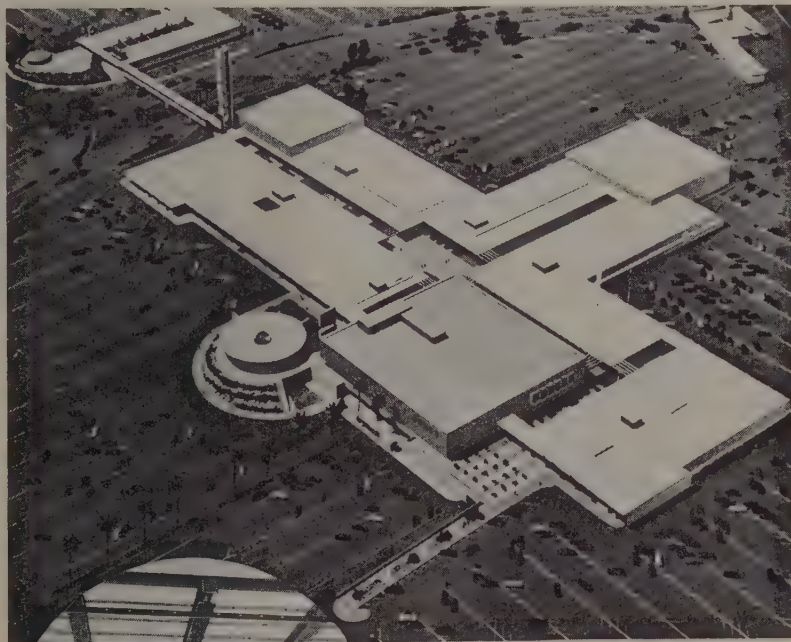
Union Pacific, fifteen 8500-hp gas turbine locomotives, to the General Electric Co., Schenectady, N. Y.; the railroad contemplates ordering 30 additional units.

RAILROAD CARS PLACED

Chicago, Milwaukee & St. Paul, 100 covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.
 Norfolk & Western, 4000 freight cars, to own shops. The cars comprise 3500 hoppers and 500 gondolas.
 Spokane, Portland & Seattle, 500 fifty-ton boxcars to be constructed at shops of the Great Northern Railroad at St. Cloud, Minn.; delivery last quarter of 1956.

RAILS PLACED

New York Central, 38,800 tons; 21,000 tons going to U. S. Steel Corp., Pittsburgh; 14,000 tons to Bethlehem Steel Co., Bethlehem, Pa.; and 3800 to Inland Steel Co., Chicago. The remaining 1200 tons required for the New York Central's 1956 program of 40,000 tons are along the tracks.
 Northern Pacific, 2000 tons of tie plates for 1956 requirements, to Bethlehem Pacific Coast Steel Corp., Seattle.



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 Architect: John Graham and Company, Seattle.
 Contractor: Farnsworth and Chambers.

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Gulfgate Shopping City near Houston, established by Allied Stores Corp., is like most things in Texas . . . big. The \$20,000,000 project will house 90 to 100 stores, including Joske's department store with 207,000 square feet of space. Overall, there are 840,000 square feet, facilities to park 20,000 automobiles a day. Steel for this gigantic, modern development was furnished by Ingalls.

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STEEL DIVISION



Borg-Warner Corporation

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Plant: New Castle, Indiana

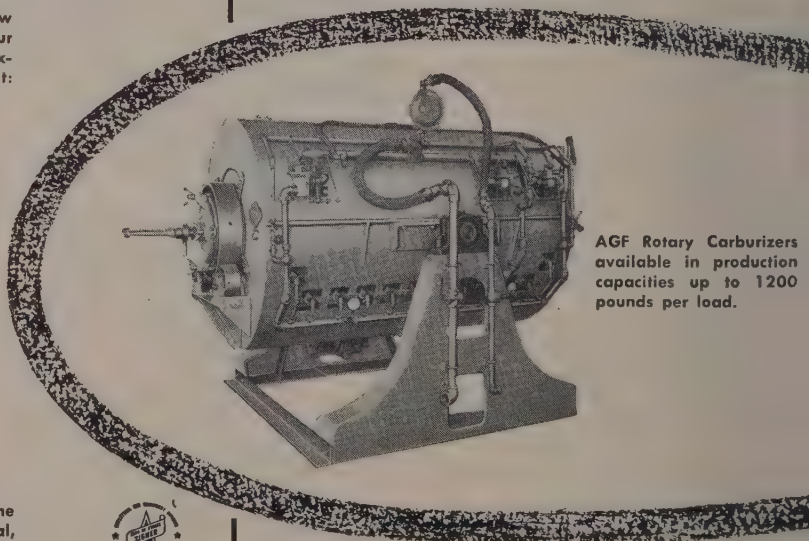
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Gentle tumbling of the work pieces by slow retort rotation — one revolution every four minutes—assures uniform heating and exposure to the controlled atmosphere. Result: better products.

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- AGF Carburizers are flexible. The same one can be used to clean, harden, anneal, normalize, etc. a wide variety of work without modification.

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Current Ferroalloy Quotations

MANGANESE ALLOYS

High-Carbon Ferromanganese: Carlot, per gross ton, Palmerton, Pa., 21-23% Mn, \$90.50; 19-21% Mn, 1-3% C, \$88; 16-19% Mn, \$86.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton \$190, Clairton, Pa.; Johnstown and Sheridan, Pa.; Alloy, Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract \$2.00 for each 1% or fraction thereof of contained manganese over 74% or under 74%, respectively.

Low-Carbon Ferromanganese: (Mn 79-81%). Lump \$198 per net ton, f.o.b. Maconada or Great Falls, Mont. Add \$2.60 for each 1% above 81%; subtract \$2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 29.95¢ per lb of contained Mn, carload packed 30.7¢, ton lots 31.8¢, less ton 3¢. Delivered. Deduct 1.5¢ for max 0.15% C grade from above prices, 3¢ for max 0.30% C, and 6.5¢ for max 0.50% C, and 6.5¢ for max 0.75% C. **Special Grade:** (Mn 90-95%, C 0.07% max, P 0.06% max). Add 2.05¢ to the above prices. Spot, add 0.25¢.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk 21.85¢ per lb of contained Mn, packed, carload 22.9¢, ton lot 24.5¢, less ton 25.7¢. Delivered. Spot, add 0.25¢.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 4.5% max, Si 1.5% max, C 0.2% max). Carload, lump, bulk, 45¢ per lb of metal; packed, 47.5¢; ton lot 47.25¢; less ton lots 49.25¢. Delivered. Spot, add 2¢.

Electrolytic Manganese Metal: Min carload, c.i., 2000 lb to min carload, 32¢; 250 lb to 99 lb 34¢. Premium for hydrogen-removed metal, 0.75¢ per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

High-Carbon Ferromanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.2¢ per lb of alloy. Packed, c.i. 12.2¢, ton 12.65¢, less ton 13.65¢, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2¢ from above prices. For 3% C grade, Si 12-14.5% deduct 0.4¢ from above prices. Spot, add 0.25¢.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, \$1.50 per lb of contained Ti; less ton \$1.55. (Ti 38-43%, Al 6% max, Si 4% max, C 0.10% max). Ton lots \$1.35, less ton \$1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5¢.

Ferrotitanium, High-Carbon: (Ti 15-13%, C 8%). Contract \$177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 4.5%). Contract \$195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.i., lump, bulk 26.25¢ per lb of contained Cr; c.i. packed 27.5¢, ton lot 29.25¢, less ton 30.65¢. Delivered. Spot, add 0.25¢.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (impex) 31.75¢ per lb contained Cr, 0.02% max 38.50¢, 0.03% max 38¢, 0.06% max 50¢, 0.1% max 36¢, 0.15% max 35.75¢, 0.2% max 35.00¢, 0.5% max 35.25¢, 1.0% max 34¢, 1.5% max 33.50¢, 2.0% max 33.75¢. Ton lot, add 3.1¢, less ton add 4.8¢. Carload packed add 1.45¢. Delivered. Spot, add 0.25¢.

Foundry Ferrochrome, High-Carbon: (Cr 62-64%, C 5-7%, Si 7-10%). Contract, c.i. 8 M x 12 M, bulk 27.4¢ per lb contained Cr. Packed 28.7¢, ton 30.5¢, less ton 32¢. Delivered. Spot, add 0.25¢.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed 8 M x D, 19.6¢ per lb of alloy, ton lot 20.85¢; less ton lot 22.05¢. Delivered. Spot, add 0.25¢.

Low-Carbon Ferrochrome-Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 39.05¢ per lb of contained Cr; 1" x down, bulk 39.8¢. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.2% min, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about 1/4" thick) \$1.25 per lb, ton lots \$1.27, less ton lots \$1.28. Delivered. Spot, add 5¢.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, \$3.10 per lb of contained V. Delivered. Spot, add 10¢. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) \$3.20. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) \$3.30.

Grainal: Vanadium Grainal No. 1, \$1.05 per lb; No. 6, 68¢; No. 79, 50¢, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, \$1.33 per lb contained V₂O₅, freight allowed. Spot, add 5¢.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0¢ per lb of contained Si. Packed 21.40¢; ton lot 22.50¢ f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.75¢ per lb of contained Si. Packed, c.i. 13.85¢, ton lot 15.3¢, less ton 16.95¢. F.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45¢.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.2¢ to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 14.5¢ per pound contained silicon. Packed, c.i. 16.2¢, ton lots, 18¢; less ton 19.35¢. Delivered. Spot, add 0.35¢.

75% Ferrosilicon: Contract, carload, lump, bulk, 15.4¢ per lb of contained Si. Packed c.i. 17.05¢, ton lot 18.7¢, less ton 19.95¢. Delivered. Spot, add 0.3¢.

90% Ferrosilicon: Contract, carload, lump, bulk, 18.5¢ per lb of contained Si. Packed, c.i. 19.95¢, ton lot 21.35¢, less ton 22.4¢. Delivered. Spot, add 0.25¢.

Silicon Metal: (Min 98% Si, 0.75% max Fe, 0.07% max C). C.i. lump, bulk, 20.5¢ per lb of Si. Packed, c.i. 21.95¢, ton lot 23.25¢, less ton 24.25¢. Add 0.5¢ for max 0.03% C grade. Deduct 0.5¢ for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25¢.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65¢ per lb of alloy. Ton lots packed 11.8¢.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.i. lump, bulk 8.5¢ per lb of alloy. Packed, c.i. 9.5¢, ton lot 10.65¢, less ton 11.5¢. Delivered. Spot, add 0.25¢.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 26.25¢ per lb of alloy, ton lot 27.4¢, less ton 28.85¢. Freight allowed. Spot, add 0.25¢.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, \$1.20 per lb of alloy; less than 100 lb \$1.30. Delivered. Spot, add 5¢. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85¢ per pound; Grade B (14-18% B) \$1.20; Grade C (19% min B) \$1.50.

Borosil: (3 to 4% B, 40 to 45% Si). \$5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45¢ per lb; smaller lots, 50¢ per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50¢ per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 22¢ per lb of alloy, carload packed 23.05¢, ton lot 24.95¢, less ton 25.95¢. Delivered. Spot, add 0.25¢.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 21.5¢ per lb of alloy, carload packed 22.95¢, ton lot 25.25¢, less ton 26.75¢. Delivered. Spot, add 0.25¢.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.95¢ per lb of briquet, carload packed in box pallets 17.15¢, in bags 17.85¢; 3000 lb to c.i. in box pallets 18.35¢; 2000 lb to c.i. in bags, 19.05¢; less than 2000 lb in bags 19.95¢. Delivered. Add 0.25¢ for notching. Spot, add 0.25¢.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.1¢ per lb of briquet, c.i. packed, pallets 12.3¢, bags 13.1¢; 3000 lb to c.i., pallets 13.5¢; 2000 lb to c.i., bags, 14.3¢, less ton 15.2¢. Delivered. Add 0.25¢ for notching. Spot, add 0.25¢.

Silicomanganese Briquets: (Weighing approx. 3 1/2 lb and containing exactly 2 lb of Mn and approx. 1/2 lb of Si). Contract, c.i. bulk 12.7¢ per lb of briquet, c.i. packed, pallets, 12.9¢; bags 13.7¢, 3000 lb to c.i., pallets, 14.1¢; 2000 lb to c.i., bags, 14.9¢; less ton 15.8¢. Delivered. Add 0.25¢ for notching. Spot, add 0.25¢.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract carload, bulk 6.75¢ per lb of briquet; packed, pallets, 6.95¢; bags, 7.75¢; 3000 lb to c.i., pallets, 8.55¢; 2000 lb to c.i. bags 9.35¢; less ton 10.25¢. Delivered. Spot, add 0.25¢.

(Small size—weighing approx. 2 1/2 lb and containing exactly 1 lb of Si). Carload, bulk 6.9¢. Packed, pallets 7.1¢; bags 7.9¢; 3000 lb to c.i. pallets 8.7¢; 2000 lb to c.i. bags 9.5¢; less ton 10.4¢. Delivered. Add 0.25¢ for notching, small size only. Spot, add 0.25¢.

Molybdenic-Oxide Briquets: (Containing 2 1/2 lb of Mo each) \$1.14 per pound of Mo contained. f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more \$3.45 per lb of contained W; 2000 lb W or 5000 lb W, \$3.55; less than 2000 lb W, \$3.67. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, \$6.90 per lb of contained Cb. Delivered. Spot add 10¢.

Ferrotantalum-Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min C, 0.30% max). Ton lots, 2" x D, \$4.65 per lb of contained Cb plus Ta, delivered; less ton lots \$4.70.

Silicac Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45¢ per lb of alloy, ton lot 47¢, less ton 49¢. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, c.i. packed 1/2" x 12 M, 18.5¢ per lb of alloy, ton lots 19.65¢, less ton 20.9¢. Delivered. Spot, add 0.25¢.

Graphidex No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.i. packed, 18.5¢ per lb of alloy, ton lots 19.65¢; less ton lots 20.9¢, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.i. packed 17.2¢ per lb or alloy; ton lots 18.7¢; less ton lots 19.95¢, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 16.50¢. Packed c.i. 17.50¢, 2000 lb to c.i. 18.50¢, less than 2000 lb 19¢ per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of \$4 for each 1% of P above or below the base); carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., \$90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., \$1.46 in all sizes except powdered which is \$1.57; Washington, Pa., furnace, any quantity \$1.46.

Technical Molybdenic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa.; \$1.25 in cans; in bags, \$1.24, f.o.b. Langeloth, Pa.; \$1.24, Washington, Pa.

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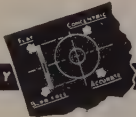
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City State
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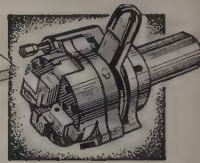


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Ores

Lake Superior Iron Ore

Prices effective for the 1955 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Mid range bessemer	\$10.40
Mid range nonbessemer	10.25
Gasabi bessemer	10.25
Gasabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract

	17.00-18.00
--	-------------

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality

	\$30.00-\$31.00
--	-----------------

Domestic, scheelite, mine

	63.00
--	-------

Manganese Ore

Mn 48%, nearby, \$1.06-\$1.11 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 95c-\$1.00.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for deliver to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. \$45.00-\$50.00
48% 3:1	42.00-44.00
48% no ratio	34.00

South African Transvaal

44% no ratio	\$19.00-\$20.00
48% no ratio	33.00-35.00

Domestic

Rail nearest seller

18% 3:1	\$39.00
---------	---------

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked

	\$1.00
--	--------

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	\$3.60-\$3.85
60-65%	3.85-4.00

Vanadium Ore

Cents per lb V₂O₅ content, deld. mills

Domestic

	31.00
--	-------

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahm, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalla, Mo., Ironton, Oak Hill, Farral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., \$122; Salina, Pa., \$127; Niles, O., \$133.

Super-Duty: St. Louis, \$150.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., Hawston, Pa., \$128; Warren, Niles, O., Hays, Pa., \$133; Morrisville, Pa., \$131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., \$138; Lehigh, Utah, \$144; Los Angeles, \$151.

Super Duty: Hays, Sproul, Hawston, Pa., Warren, Windham, O., Athens, Tex., \$145; Morrisville, Pa., Niles, O., \$148; Joliet, Ill., \$151; Curtner, Calif., \$163.

Semisilica Brick (per 1000)

Clearfield, Pa., \$139; Philadelphia, \$124; Woodbridge, N. J., \$122.

Insulating Fire Brick (per 1000)

2300° F.: Massillon, O., \$178.50; Clearfield, Pa., \$213; Augusta, Ga., Beaver Falls, Zellenople, Pa., Mexico, Mo., \$206; Vandalla, Mo., \$214.10; Portsmouth, O., \$207.50; Bessemer, Ala., \$212.80.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Vandalla, Mo., \$88.50; Wellsville, O., \$92.50; Clearfield, Pa., Portsmouth, O., \$98.

High-Alumina Brick (per 1000)

50 Per Cent: Clearfield, Pa., St. Louis, Mexico, Mo., \$194; Danville, Ill., \$197; Philadelphia, \$201.

60 Per Cent: St. Louis, Mexico, Vandalla, Mo., Clearfield, Pa., \$241; Danville, Ill., \$244; Philadelphia, \$248.

70 Per Cent: St. Louis, Mexico, Vandalla, Mo., \$279; Danville, Ill., \$281; Clearfield, Pa., Philadelphia, \$286.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., \$157; Clearfield, Pa., \$158.50; St. Louis, \$169.30.

Nozzles (per 1000)

Reesdale, Pa., \$253.70; Johnstown, Pa., \$259.20; Clearfield, Pa., \$259.40; St. Louis, \$259.45; Bridgeburg, Pa., \$286.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., \$196; Clearfield, Pa., \$198; St. Louis, \$195.80.

Dolomite (per net ton)

Domestic, dead-burned bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Nario, O., \$15; Thornton, McCook, Ill., \$15.60; Dolly Siding, Bonne Terre, Mo., \$14.

Magnesite (per net ton)

Domestic, dead-burned, bulk, 1/4-in. grains with fines: Chewelah, Wash., \$40; Luning, Nev., \$40. 1/2-in. grains with fines: Baltimore, \$66.40.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	\$13.25-\$14.00
Connellsville, foundry	16.00-17.00

Oven Foundry Coke

Kearny, N. J., ovens	\$25.50
Camden, N. J., ovens	25.00
Everett, Mass., ovens	
New England, deld.	*27.05
Chicago, ovens	25.75
Chicago, deld.	27.25
Terre Haute, Ind., ovens	25.50
Milwaukee, ovens	26.25
Indianapolis, ovens	25.50
Portsmouth, O., ovens	24.75
Cincinnati, deld.	27.34
Painesville, O., ovens	26.25
Cleveland, deld.	28.18
Birmingham, ovens	24.40
Cincinnati, deld.	29.33
Buffalo, ovens	25.75
Buffalo, deld.	27.00
Lone Star, Tex., ovens	19.50
Neville Island, Pa., ovens	25.00
Philadelphia, ovens	25.00
Swedeland, Pa., ovens	25.00
St. Paul, ovens	25.00
Detroit, ovens	26.25
Detroit, deld.	27.25
Pontiac, deld.	27.81
Saginaw, deld.	29.33

*Or within \$4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00
Per ton, bulk, ovens	
Ammonium sulphate	\$42-\$45
Birmingham area	\$42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Fluorspar


Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF₂ content 72.5%, \$38-\$39; 70%, \$35-\$36; 60%, \$31-\$32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, \$34; Mexican, \$25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE		Per 100 lb
Diam	Length	
Inches		
2	24	\$52.50
2 1/2	30	33.75
3	40	32.00
4	40	30.25
5 1/2	40	30.00
6	60	27.25
7	60	26.75
8	60	24.25
8 9, 10	72	27.25
12	72	23.50
14	60	22.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25
CARBON		Per 100 lb
Diam	Length	
Inches		
8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	86	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

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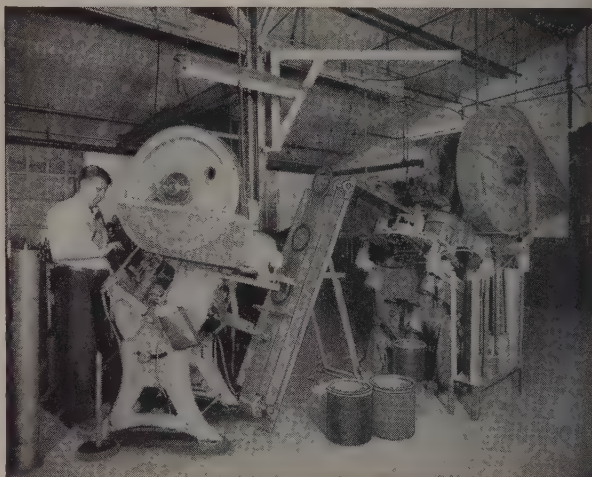
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• FLEXIBILITY

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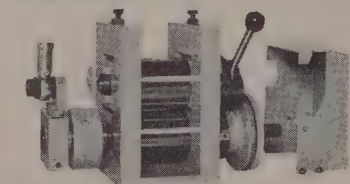
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Scrap . . .

Scrap Prices, Page 170

Chicago—Based on broker-dealer trading, the indication is that the current scrap market is from \$2 to above the last confirmed purchases by the mills. If sales have been made at these prices, the fact far is closely held by buyers and makers—obviously to prevent dealers from boosting their asking prices further.

The situation is pretty well indicated by what is happening in railroad steel, such as No. 1 heavy melting. The last confirmed sale was \$51 a ton. The current quotation is \$55, with one broker admitting rejection of a \$53 order.

New York—There is a rush of scrap demand from all directions. Quick shipments are being asked in many cases, indicating that consumer inventories are down. In addition to strong domestic demand, there is continued pressure from abroad.

While local brokers have not changed their prices on the prime grades of open-hearth scrap, at least for the moment, they have jumped their prices on No. 2 heavy melting to \$39-\$40, and on No. 2 bundles to \$35-\$36. They are paying substantially higher for machine shop turnings

at \$25-\$26; for mixed borings and turnings at \$27-\$28; and for low phosphorus structural and plate at \$45-\$46.

Buying prices on No. 1 cupola have been advanced to \$42-\$43; for unstripped motor blocks to \$26-\$27; and for heavy breakable cast to \$42-\$43.

Philadelphia—Scrap prices have advanced sharply, affecting both steel and cast grades. Domestic consumers report competition in the steel grades is especially keen from exporters who have advanced their prices \$2 a ton.

In the cast grades, U. S. Steel's Fairless mill is paying \$50.50, delivered, for No. 1 cupola. Malleable has shot up to a new high of \$62.50, delivered, as compared with the furnace price on pig iron of \$61.50. Heavy breakable has advanced to \$52, delivered.

No. 1 heavy melting, No. 1 bundles and No. 1 busheling are up \$2 to \$50, delivered. No. 2 heavy melting is \$46 and No. 2 bundles \$41. Electric furnace bundles have been sold at as high as \$51, delivered.

Cleveland—Quality grades of steel-making scrap are in demand. Prices continue to push upward. Recent sales in the Valley serve to confirm prices currently quoted, and expectations are that local consumers will make buys within the next few days at present levels.

Buffalo—Firm tendencies dominate the local scrap market. Last week the steelmaking grades jumped \$2 to \$4 a ton on substantial purchases by district mills.

Pittsburgh—Strong mill demand supports No. 1 heavy melting scrap at no less than \$48 a ton. Prices are moving upward. High-quality grades are in particularly strong demand, with railroad specialties selling at \$56 and cut structurals at \$51.

Washington—Consumption of ferrous materials (scrap and pig iron) totaled 12,635,000 gross tons in October, up 6 per cent from September, reports the Bureau of Mines. Of this total, 6,443,000 tons were scrap and 6,192,000 tons pig iron.

Stocks of ferrous scrap held by consumers at the end of October were 6,594,000 tons, up slightly from Sept. 30.

Detroit—No. 1 grades, electric furnace and foundry grades of scrap are in heavy demand. No. 2 grades and turnings are not so strong. No. 1 heavy melting is quoted at \$44, No. 2, \$34.

St. Louis—The scrap market is firm. Shipments are reported insufficient, and the mills are not getting in enough tonnage to balance with daily melts.

(Please turn to page 172)

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CARBORUNDUM®

Iron and Steel Scrap

Consumer prices, per gross ton, STEEL. Changes shown in italics.

except as otherwise noted, including broker's commission, as reported

STEELMAKING SCRAP COMPOSITE

Dec. 7	\$48.83
Nov. 30	47.00
Nov. Avg.	46.08
Dec. 1954	32.58
Dec. 1950	45.50

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting...	47.00-48.00
No. 2 heavy melting...	41.00-42.00
No. 1 bundles	47.00-48.00
No. 2 bundles	37.00-38.00
No. 1 busheling	47.00-48.00
Machine shop turnings...	30.00-31.00
Mixed borings, turnings...	30.00-31.00
Short shovel turnings...	33.00-34.00
Cast iron borings	33.00-34.00
Cut structural, 3 ft lengths	50.00-51.00
Heavy turnings	42.00-43.00
Punchings & plate scrap	42.00-51.00
Electric furnace bundles	48.00-49.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	42.00-43.00
Heavy breakable cast	42.00-43.00
Unstripped motor blocks	30.00-31.00
No. 1 machinery cast	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt.	50.00-51.00
Rails, 2 ft and under	61.00-62.00
Rails, 18 in. and under	62.00-63.00
Rails, random lengths	57.00-58.00
Railroad specialties	55.00-56.00

Stainless Steel Scrap

18-8 bundles & solids	325.00-340.00
18-8 turnings	210.00-220.00
430 bundles & solids	100.00-110.00
430 turnings	60.00-65.00

CLEVELAND

No. 1 heavy melting...	49.00-50.00
No. 2 heavy melting...	40.00-41.00
No. 1 bundles	49.00-50.00
No. 2 bundles	36.00-37.00
No. 1 busheling	49.00-50.00
Machine shop turnings...	25.00-26.00
Mixed borings, turnings...	29.00-30.00
Short shovel turnings...	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	49.00-50.00
Cut structural plates 2 ft and under	55.00-56.00
Alloy free, short shovel turnings	34.00-35.00
Electric furnace bundles	49.00-50.00

Cast Iron Grades

No. 1 cupola	50.00-51.00
Charging box cast	40.00-43.00
Stove plate	49.00-50.00
Heavy breakable cast	40.00-41.00
Unstripped motor blocks	32.00-33.00
Brake shoes	38.00-39.00
Clean auto cast	51.00-52.00
Burnt cast	38.00-39.00
Drop broken machinery	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt.	52.00-53.00
R.R. malleable	55.00-56.00
Rails, 2 ft and under	66.00-67.00
Rails, 18 in. and under	67.00-68.00
Rails, random lengths	60.00-61.00
Cast steel	54.00-55.00
Railroad specialties	58.00-59.00
Uncut tires	54.00-55.00
Angles, splice bars	62.00-63.00
Rails, rerolling	66.00-67.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	325.00-335.00
18-8 turnings	190.00-200.00
430 clips, bundles, solids	95.00-105.00
430 turnings	45.00-55.00

YOUNGSTOWN

No. 1 heavy melting...	52.00-53.00
No. 2 heavy melting...	40.00-41.00
No. 1 bundles	52.00-53.00
No. 2 bundles	36.00-37.00
No. 1 busheling	52.00-53.00
Machine shop turnings...	29.00-30.00
Short shovel turnings...	34.00-35.00
Cast iron borings	29.00-30.00
Low phos.	54.00-55.00
Electric furnace bundles	47.50-48.50

Railroad Scrap

No. 1 R.R. heavy melt.	52.00-53.00
------------------------	-------------

CHICAGO

No. 1 heavy melting...	48.00-50.00
No. 2 heavy melting...	39.00-40.00
No. 1 factory bundles...	50.00-51.00
No. 1 dealer bundles...	47.00-48.00
No. 2 bundles	35.00-36.00
No. 1 busheling	48.00-50.00
Machine shop turnings...	27.00-28.00
Mixed borings, turnings...	29.00-30.00
Short shovel turnings...	29.00-30.00
Cast iron borings	29.00-30.00
Cut structural, 3 ft	51.00-52.00
Punchings & plate scrap	52.00-53.00

Cast Iron Grades

No. 1 cupola	49.00-50.00
Stove plate	40.00-41.00
Unstripped motor blocks	37.00-38.00
Clean auto cast	53.00-54.00
Drop broken machinery	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt.	52.00-53.00
R.R. malleable	58.00-59.00
Rails, 2 ft and under	67.00-68.00
Rails, 18 in. and under	68.00-69.00
Angles, splice bars	63.00-64.00
Rails, rerolling	73.00-74.00

Stainless Steel Scrap

18-8 bundles & solids	320.00-335.00
18-8 turnings	225.00-235.00
430 bundles & solids	100.00-105.00
430 turnings	45.00-50.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	44.00
No. 2 heavy melting	34.00
No. 1 bundles	44.00
No. 2 bundles	31.00
No. 1 busheling	44.00
Machine shop turnings...	22.00
Mixed borings, turnings...	22.00
Short shovel turnings...	24.00
Punchings & plate scrap	53.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	36.00
Stove plate	34.00
Heavy breakable	35.00
Unstripped motor blocks	22.00
Clean auto cast	46.00
Malleable	40.00

BIRMINGHAM

No. 1 heavy melting...	42.00-43.00
No. 2 heavy melting...	38.00-39.00
No. 1 bundles	42.00-43.00
No. 2 bundles	30.00-31.00
No. 1 busheling	42.00-43.00
Cast iron borings	18.00-19.00
Short shovel turnings...	29.00-30.00
Machine shop turnings...	28.00-29.00
Electric furnace bundles	47.00-48.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.50-48.00
Stove plate	44.50-45.50
Bar crops and plate	50.00-51.00
Structural plate, 2 ft.	49.00-50.00
Unstripped motor blocks	36.00-37.00
Charging box cast	30.00-31.00
No. 1 wheels	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
Rails, 18-in. and under	61.00-62.00
Rails, rerolling	62.00-63.00
Rails, random lengths	55.00-56.00
Angles, splice bars	57.00-58.00

PHILADELPHIA

No. 1 heavy melting...	50.00
No. 2 heavy melting...	46.00
No. 1 bundles	50.00
No. 2 bundles	41.00
No. 1 busheling	51.00
Electric furnace bundles...	51.00
Machine shop turnings...	35.00
Mixed borings, turnings...	35.00
Short shovel turnings...	38.00
Heavy turnings	46.00
Structurals, & plate	52.50
Couplers, springs, wheels	54.50
Rail crops, 2 ft & under	63.00

Cast Iron Grades

No. 1 cupola	50.50
Malleable	62.50
Heavy breakable cast	52.00
Drop broken machinery	57.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	43.00-44.00
No. 2 heavy melting...	39.00-40.00
No. 1 bundles	43.00-44.00
No. 2 bundles	35.00-36.00
Machine shop turnings...	25.00-26.00
Mixed borings, turnings...	27.00-28.00
Short shovel turnings...	28.00-29.00
Low phos. (structural & plate)	45.00-46.00

Cast Iron Grades

No. 1 cupola	42.00-43.00
Unstripped motor blocks	26.00-27.00
Heavy breakable	42.00-43.00

Stainless Steel

18-8 sheets, clips, solids	300.00-310.00
18-8 borings, turnings	150.00-160.00
430 sheets, clips, solids	120.00-125.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	40.00-41.00
No. 2 heavy melting...	35.00-36.00
No. 1 bundles	40.00-41.00
No. 2 bundles	30.00-31.50
Machine shop turnings...	23.00-24.00
Mixed borings, turnings...	23.50-24.50
Short shovel turnings...	26.00-27.00
No. 1 cast	37.00-37.50
Mixed cupola cast	35.00-35.50
No. 1 machinery cast	40.00-40.50

BUFFALO

No. 1 heavy melting...	45.00-46.00
No. 2 heavy melting...	39.00-40.00
No. 1 bundles	45.00-46.00
No. 2 bundles	36.00-37.00
No. 1 busheling	45.00-46.00
Mixed borings, turnings...	30.00-31.00
Machine shop turnings...	28.00-29.00
Short shovel turnings...	31.00-32.00
Cast iron borings	31.00-32.00
Low phos.	48.00-49.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	40.00-41.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths	55.00-56.00
Rails, 3 ft and under	57.00-58.00
Railroad specialties	47.00-48.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	45.00-46.00
No. 2 heavy melting...	39.00-40.00
No. 1 bundles	45.00-46.00
No. 2 bundles	35.00-36.00
No. 1 busheling	45.00-46.00
Machine shop turnings...	30.00-31.00
Mixed borings, turnings...	27.50-28.50
Short shovel turnings...	32.50-33.50
Cast iron borings	27.50-28.50
Low phos., 18 in.	50.00-51.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Heavy breakable cast	52.00-53.00
Charging box cast	42.00-43.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	48.00-49.00
Rails, 18 in. and under	63.00-64.00
Rails, random lengths	55.00-56.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting...	47
No. 2 heavy melting...	39
No. 1 bundles	41
No. 2 bundles	35
Machine shop turnings...	28
Short shovel turnings...	28

Cast Iron Grades

No. 1 cupola	49
Charging box cast	49
Heavy breakable cast	40
Unstripped motor blocks	40
Brake shoes	47
Clean auto cast	40
Stove plate	40

Railroad Scrap

No. 1 R.R. heavy melt.	50
Rails, 18 in. and under	65
Rails, random lengths	59
Rails, rerolling	65
Angles, splice bars	59

SEATTLE

No. 1 heavy melting	44
No. 2 heavy melting...	40
No. 1 bundles	40
No. 2 bundles	34
No. 3 bundles	25
Machine shop turnings...	15.00-16.00
Mixed borings, turnings...	15.00-16.00
Short shovel turnings...	15.00-16.00
Electric furnace, No. 1	55

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	50
Heavy breakable cast	38
No. 1 wheels	35
Unstripped motor blocks	40
Clean motor blocks	40
Stove plate (f.o.b. plant)	35
Brake shoes	35

Railroad Scrap

Rails, random lengths	33
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LOS ANGELES

No. 1 heavy melting...	39
No. 2 heavy melting...	37
No. 1 bundles	39
No. 2 bundles	35
Machine shop turnings...	12

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	43.00-45.00
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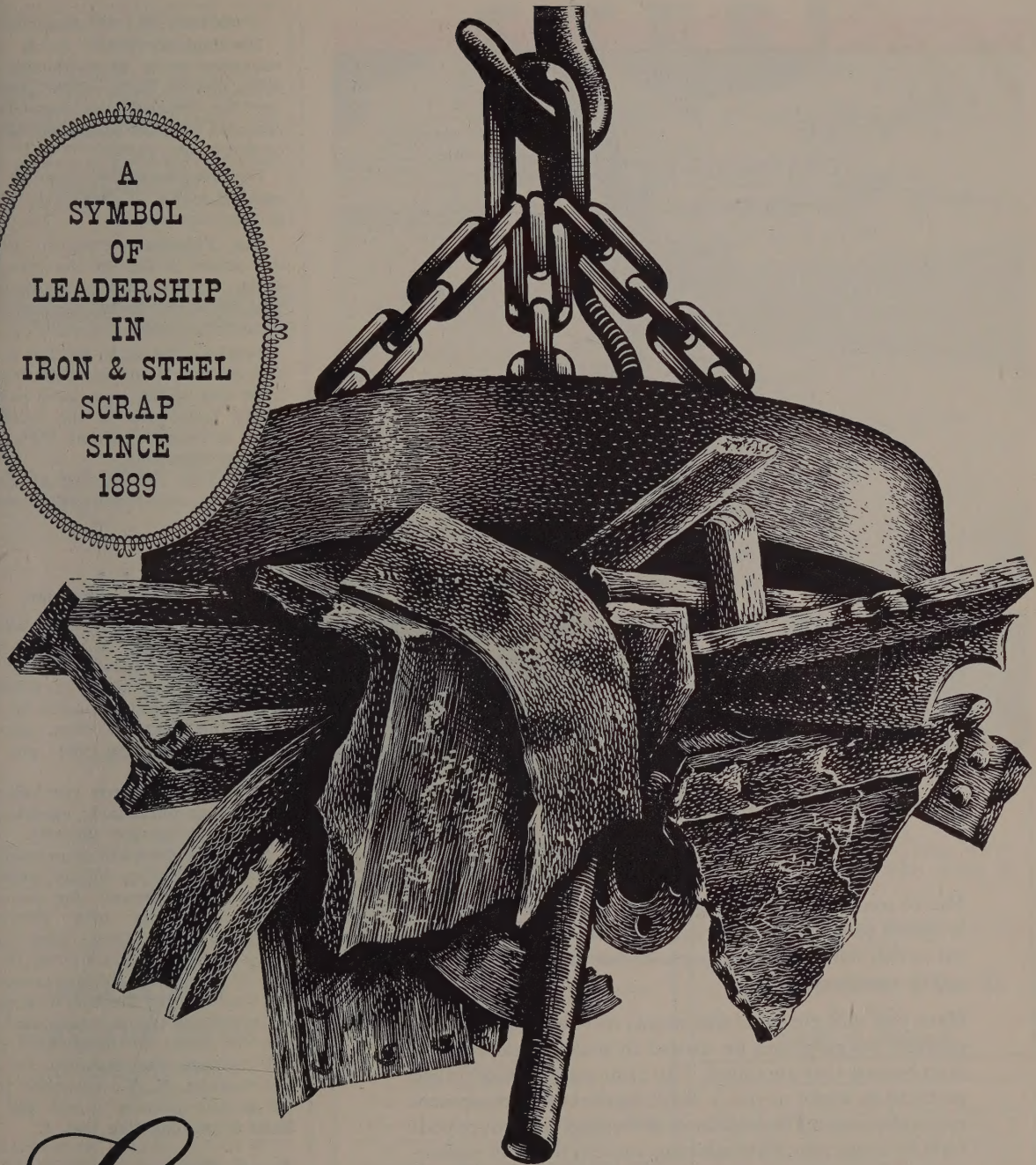
SAN FRANCISCO

No. 1 heavy melting...	39
No. 2 heavy melting...	37
No. 1 bundles	39
No. 2 bundles	33
No. 1 busheling	39
Machine shop turnings...	18
Mixed borings, turnings...	18
Short shovel turnings...	20
Cast iron borings	18
Cut structurals	41
Heavy turnings	20
Punchings & plate scrap	39

Cast Iron Grades

No. 1 cupola	50
Charging box cast	35
Stove plate	39
Heavy breakable cast	36
Unstripped motor blocks	32
Brake shoes	35
Clean auto cast	45

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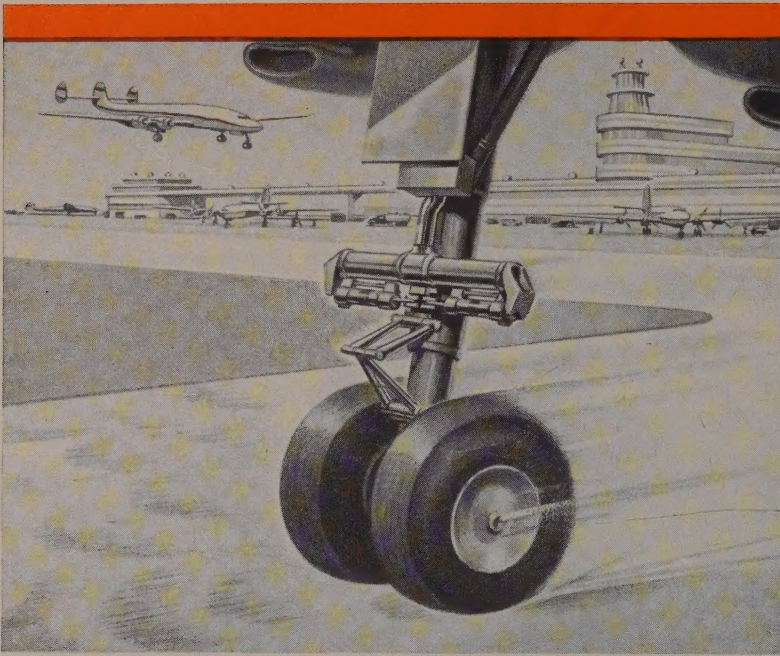
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(Concluded from page 169)

Birmingham—Steel scrap price advanced \$1 to \$2 a ton last week when district mills entered the market for limited quantities. Dealers say cold weather has slowed the flow of scrap into yards.

Los Angeles—The flow of steel making scrap to dealers is reduced in some instances.

San Francisco—Pressure for rising prices is felt in the local steel scrap market, but predictions are that there will be no increase in the immediate future.

Seattle—The scrap market is firm and demand is active. While receipts from east of the mountains have declined, collections in the local area have increased, current high prices proving attractive.

Exporters are buying at today's levels and trans-Pacific shipments are heavy.

Pig Iron . . .

Pig Iron Prices, Page 157

Sharply advancing prices and the growing shortage of quality scrap are boosting demand for pig iron. High operating rates at foundries coupled with good prospects for large melts the next 90 days, also are factors stimulating the pig iron market.

Orders for pig iron are beginning to press uncomfortably against merchant blast furnace capacity.

Many foundries will close down during the Christmas holiday week, also counting for request for postponement of some iron shipments.

Sharon Steel Corp. blew in its Mary furnace at Lowellville, O. (one of the oldest blast furnaces in the world). The furnace, with capacity of 148,620 tons annually, had been idle for about 14 months.

Pittsburgh Metallurgical Co., Niagara Falls, N. Y., advanced price on electric-furnace, silvery pig iron \$5.50 a ton, effective Dec. 1.

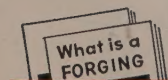
Iron Ore . . .

Iron Ore Prices, Page 167

Shipments of Lake Superior iron ore in the week ended Dec. 5 totaled 334,421 gross tons, reports the Lake Superior Iron Ore Association. This compares with 106,817 tons moved in the corresponding week a year ago.

The week's shipments brought the cumulative movement for the 1954 navigation season to 87,419,645 tons up sharply from the 60,793,697 tons moved in 1954.

The 1955 total is about 4 million tons above the previous high movement for a nonwar year, in 1950, and is only 9 million tons under the all-time record (96 million tons in 1953).



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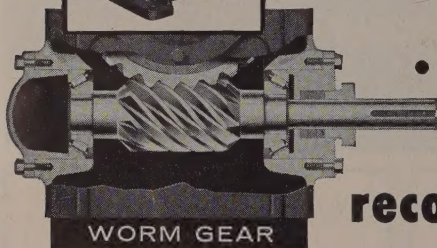
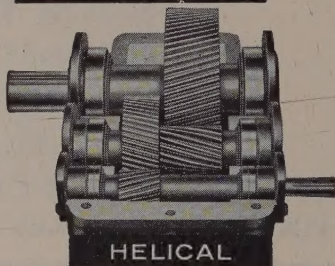
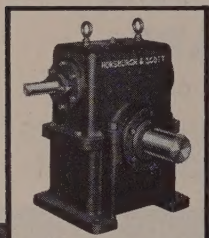
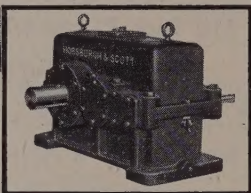
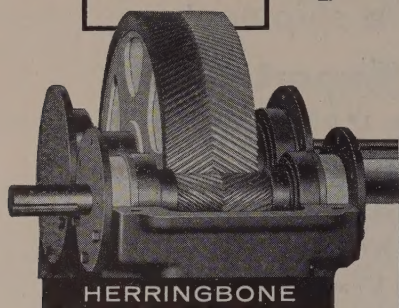
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Tool Steel . . .

Tool Steel Prices, Page 156

Shipments of high speed and tool steel (excluding hollow drill steel) totaled 9418 net tons in September, reports the American Iron & Steel Institute. This was down slightly from the 8994 tons shipped in August but was up sharply from the 6269 tons moved in September, 1956.

Cumulative shipments in the first nine months of this year were 83,000 net tons. This compares with 62,900 tons in the like period a year ago.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 152

Strong demand for reinforcing steel items is indicated well into 1957. Substantial volume is seen continuing in road construction and public structures of various kinds.

Gov. Stratton of Illinois announced that his state is scheduling \$127,305,000 in highway construction next year. This year Illinois allotted \$123,600,000 for road and bridge building—although as of Nov. 15, contracts for only \$86 million had been awarded.

Warehouse . . .

Warehouse Prices, Page 157

Undertone of the warehouse steel market is strong, reflecting low stocks, heavy demand and upward revision in some mill prices. Philadelphia distributors have advanced prices $\frac{3}{4}$ -cent on junior structural sections, following recent mill increases, and are contemplating revision in sheet and strip prices also reflecting changes in mill prices and extras.

Distributors' stocks are so low in some districts they can't help fabricators needing emergency shipments.

Rails, Cars . . .

Track Material Prices, Page 155

Orders for 1000 freight cars were received last week by the Bessemer Ala., plant of Pullman-Standard Car Mfg. Co. Orders since Nov. 1 total more than \$20 million. Seaboard Air line ordered 500 seventy-ton hopper cars at a cost of \$4 million. It already has 500 cars on order at the plant and 500 more will be built by Bethlehem Steel Co. and Magor Car Corp.

Central of Georgia ordered 500 box cars at a cost of \$3.5 million. It, too, has 500 cars on order, with deliveries scheduled for March, 1956.

The Bessemer plant's heavy order backlog will keep it in full operation well into 1957.

The Atchison, Topeka & Santa Fe will lay 255 miles of welded rail next year.